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Media House, 21 Kingsway, Bedford MK42 9BJ
Telephone: +44 (0) 8707 333733
Fax: +44 (0) 1234 261251
Email: mail@sampublications.com

PUBLISHER SAM Publications

GROUP EDITOR Neil Robinson

Media House, 21 Kingsway, Bedford MK42 9BJ
Email: neil@sampublications.com

ASSISTANT EDITOR Andy Evans

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ART DIRECTOR Simon Sugarhood

EDITORIAL CONSULTANT Paul Lucas

SAM PUBLICATIONS EMAIL

mail@sampublications.com

Use this address for back issue orders, subscriptions or subscription enquiries or book orders. Note that we cannot undertake research into specific or general aviation queries and that there may be some delays in responses from the contributors, as they are not based at the editorial address.

ADVERTISING SALES Christine McCarthy

Email: chris@sampublications.com Tel: +44 (0) 8707 333733

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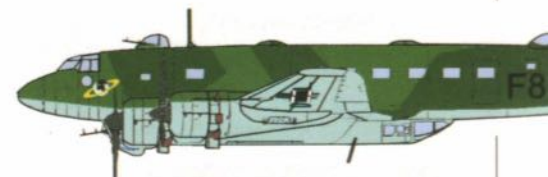
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Legends...

Last month's news about the sad demise of Alan W Hall, (1928 - 2008), not unnaturally got me, and many of my geriatric modelling mates, thinking about when we first came across the name of Alan W Hall, and how much water has flowed under the hypothetical modelling bridge since then...

My earliest memories of the 'great man' start way back in the mid-1960s as an awe-struck youth, who eagerly devoured every word of the monthly conversion articles he used to produce for 'Airfix Magazine'. Although I never quite managed to fully master his balsa wood and talcum powder technique, the very idea that plastic construction kits could be modified and converted into other Marks and variants, and even different types altogether, was ground-breaking to me and I suspect most other of us embryonic modellers at the time!

In fact it was probably 'Uncle Alan', (as we irreverently nicknamed him), who first planted the precocious idea that I might be brazen enough to offer to write modelling articles and kit reviews for commercial modelling magazines, and look where those first faltering steps have taken me... *Alan has got a lot to answer for!*

However, although he could be a cantankerous old devil at times, (as anyone who crossed swords with him found out), his influence within

"I think it is right and proper that he should be remembered as the 'father' of our hobby..."

the hobby cannot be underestimated. He probably did more to promote and develop the hobby of plastic aircraft modelling than any other single individual, and for that alone, I will be eternally grateful to him.

I followed Alan W Hall's modelling/aviation journalistic career all through his days with 'Airfix Magazine', first as a major contributor and then as editor of that hallowed publication, and the lovely little Airfix Magazine spin-off 'Guide' books he edited for PSL Publications; then when he created 'Aviation News', which was a fortnightly, broadsheet format publication for years, (*where did he get the time to put all that information together every two weeks?*), which always had scale plans in the centre pages, (which I have still got stored away), and then later with 'Scale Aircraft Modelling', of which more in a moment. His final enterprise was the ever excellent 'Warpaint' series of books, which he was still actively producing and editing when he died. He was certain-



One of the stars of the IPMS Scale Modelworld 2008 show... the 'legendary' 1/48 scale Airfix TSR.2

ly a prolific individual!

I had met 'Uncle Alan' on many occasions before I was asked by Guideline Publications to take over from him as editor of 'Scale Aircraft Modelling' at the end of 1998. He was naturally very reluctant to let the reins go of 'his baby', but he had so many other projects he was involved with at the time, even he realised something had to give.

He always kept a fatherly eye on what I was doing with 'his baby' and as I got into my stride with the publication, there would be times when we "agreed to disagree" on some aspect or other - he had very 'definite' ideas about how certain things should be done!

For all his gruff exterior, (he didn't suffer fools, - gladly or otherwise...), once you were his friend, you were a friend for life, as many modellers will pay testament.

I think it is right and proper that he should be remembered as 'the father' of our hobby as we

However, I was privileged to meet his son Christopher at this year's show, who was on his Dad's 'Warpaint' stand, as well as hundreds of other people - readers, contributors and new and old friends, including three who had travelled an awful long way to get there - old friends Bill Bosworth from the US and Moshe Weinberg from Israel, and Juanita Franzi, the superb Australian illustrator, who I had never actually met before although we have exchanged correspondence for years! Unfortunately she now knows I'm not a virile 30-something, 6 foot 6 inches tall, blond and built like an outside dunny... *reality can be so cruel...*

As normal, I didn't get much time to wander around the halls, or indeed the competition area, but I understand the standards were exceptionally high again this year. I DID do a lot of talking and 'networking' though! There is so much 'business' that goes on at Telford over the weekend that I bet most of the modelling magazine editors who gather at the show like vultures get a good few month's worth of contributions sorted out there! I know we did!

On behalf of the SAM Publications 'travelling road show', I would like to sincerely thank all the members of the IPMS (UK) Exec Committee for yet another superbly run 'Scale Modelworld' - which, in IPMS(UK) President Paul Regan's own words at the Saturday night banquet, "is quite the best model show in the world!"

Thanks to all the guys and gals that 'looked after the traders' - the 'setting up' and 'stripping down' operations on the Friday and the Sunday went like clockwork - and the bit in the middle was quite good too! And ladies and gentlemen, just think, there are only 51 weeks to the next one!

Merry Christmas and a Happy New Year!

Finally, it is 'traditional' that the Editorial Team here at 'MAM' and SAM Publications wish 'you and yours' a very Merry Christmas and a Happy New Year! in this issue, which despite its January cover date will actually be on sale over the festive period.

I'm not sure what 2009 will bring, but I do know, despite the universal financial problems the world is experiencing at the moment, we at SAM Publications will continue to fill our three modelling magazines and growing range of books with as much aeronautical, AFV and modelling 'cheer' as we can - and judging by the proposed releases already announced by the major plastic construction kit manufacturers, *there'll be plenty of legendary subjects to go at...* **MAM**

Neil Robinson
Group Editor
Model Aircraft Monthly



Alan W Hall, 1928-2008, the sadly missed 'father' of our hobby...

know it today. It is doubtful whether we shall see the likes of such a character again and I'm sure there will be many more tributes written about Alan W Hall over the next few months. He was certainly a legend in his own lifetime, and his presence within the hobby will be sadly missed.

Keeping with the 'legend' theme, this particular issue is full of 'legendary topics', starting with the Bristol F.2B Fighter, then KG 40's 'Scourge of the Atlantic' Fw 200 Condor, onto 'Queen of the Flying Boats', the Short Sunderland, and coming more up to date with LTV's A-7 Corsair II and 'our own' Tornado F.3 - a legendary mix of subjects if ever there was one, but first, mention of a legendary weekend...

IPMS(UK) Scale Modelworld 2008

As I write this editorial, the memories of the IPMS(UK) 'Scale Modelworld' show are still fresh in my mind.

I know Alan Hall always enjoyed 'The Nationals' weekend and was planning to attend again this year until his health took a turn for the worse.



In this issue: 'Airfile', the 8-page colour schemes and markings supplement. Sponsored by



Part 9:
Short Sunderland Mk III

Next Month
Part 10: TSR.2

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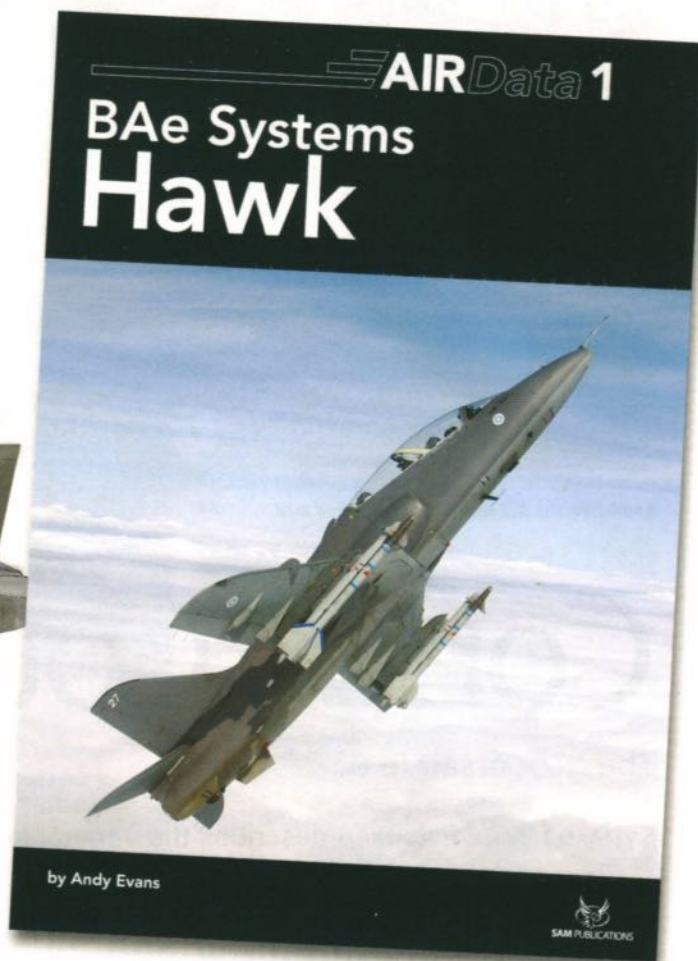
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A well-used, and well-weathered, 'operational' A-7H

Corsair Country

The A-7 Corsair in Greek service

Kyriakos 'Kirk' Palouljian describes the venerable A-7 Corsair in Greek service

Part 1: The A-7H

During the Greek Junta regime of 1973-74, the Hellenic Air Force leadership opted for a major reorganisation of its equipment. The selection of the McDD F-4E had been made about a year previously, resulting in the Phantoms being present during the invasion of Cyprus by Turkey in July 1974.

That month saw Greece getting extremely close to the very edge of war with its former ally, but old adversary, over Cyprus. On 20 July 1974, Turkish troops were dropped from Army Bell UH-1 and AB.204 helicopters near Kyrenia on the island's north coast and parachuted in from C-160



No.347 'Perseus' Sqn badge

Transall and C-47 Dakotas around Nicosia, whilst *Türk Hava Kuvvetleri*, (THK – Turkish Air Force), F-100s and F-104Gs attacked targets around Nicosia, including the Greek Cypriot National Guard barracks, and soon both air forces were engaging in 'close encounters' over the Aegean Sea.

The Turkish air offensive was renewed on 14 August with airstrikes by F-100s on Famagusta, but on the following day a ceasefire was agreed, virtually cutting the island in two.



LTV A-7H Corsair II badge

During that troubled year, the HAF (Hellenic Air Force) signed five different contracts with companies for the acquisition of A-7H Corsairs, Mirage F.1CGs, C-130H Hercules, T-2E Buckeyes and G-164 Grumman Agcats. In fact the invasion of Cyprus and the events leading up to it including the bombardment of Greek-Cypriot National Guard emplacements by the THK in 1964, set the path at the Operational & Technological bureau of HAF Staff for procurement of the LTV A-7H Corsair.

An offer of used US Navy A-4 Skyhawks was refused by the HAF leadership, but on 17 June 1974, a contract was signed with LTV to procure sixty A-7H Corsairs for \$252,000,000. The HAF needed a modern attack aircraft with the endurance, extra range and firepower to 'fly the flag' over Cyprus and the south-eastern islands of the Aegean archipelago.

The Cyprus 'issue' and the invasion of July/August 1974 was a lesson for HAF tacticians. Another smaller fact that played its role in the selection of the A-7 was the 'Best Hit' NATO exercise. This exercise in the south-eastern region tested the attack capability of HAF, THK and Aeronautica Militare Italiana (AMI – Italian Air Force) assets, in which USAF and USN teams participated as observers.

In two of the exercises, the USN team operated A-7B/E Corsairs, from VA-37 'Bulls' and VA-15 'Vallions', and in one particular year, (1972), the Corsairs were hosted at Larissa Air Base.



A-7H, BuNo 159918 – with everything 'down'...

During February 1975 a team of five HAF pilots mostly from F/RF-84F Thunderstreak/Thunderflash and F-104G Starfighter backgrounds arrived in NAS Cecil Field in Jacksonville, Florida. Their task was to become proficient on the A-7E Corsair. As there were no two-seat Corsairs in service then, familiarisation flights were performed with TA-4J Skyhawks. Later on they attended the 'Corsair College' in VA-147 'Hell Raisers' that was the Fleet Replacement Squadron for the East coast.

The first five pilots graduated after some intensive attack training on the A-7E in the MCAS Yuma ranges in Arizona, with strafing, dive-bombing and night missions on the menu. The Navy Instructor pilots, who had plenty of experience from their South East Asian missions, showed no mercy on



One of the initial delivery A-7Hs fitted with a FOD guard



A-7H, BuNo 159913 on the flight pan awaiting the day's flying

their Greek students. Following their graduation ceremony, five more aspirants came from Greece as the first five returned back home to establish the base for the new arrivals.

Meanwhile in Dallas, Texas, on 6 May 1975, LTV test pilot Jim Read took off from the runway

than the USAF training guide.

This USN-HAF cooperation dated back to 1949 with the training of HAF-operated SB2C-5 Hell-divers. So it was that HAF trainee pilots got accustomed to 'touch-and-goes', hot seat training and low-level training sorties. Day and night bombing,

strafing and rocket firing was carried out at the nearby firing range, all of which added up to an exhausting and demanding schedule for the trainee pilots.

By the arrival of the first Corsairs into HAF service even more pressing training was enforced in order to bring the Squadron up to combat ready status in minimal time. In 1975 Greece and



HAF pilot climbing out of his A-7H after another sortie...

"... on 17 June 1974, a contract was signed with LTV to procure sixty A-7H Corsairs..."

with the first Greek Corsair built for HAF, BuNo 159662. The HAF squadron chosen to accept the entry into service of these new aircraft was No.340 Squadron in the process of reforming at Souda Bay, Crete.

The first two Corsairs landed at Souda on 31 August 1975 – a new but challenging era was about to begin. Two USN pilots, Commander Bob Lakari and Escobar, were present to help out the evaluation, training and any other difficulties that could arise, as Greece was the only export customer of the Corsair at the time. The HAF opted to use a copy of the USN training curriculum, rather



Almost a perfect profile view of A-7H, BuNo 159921

Turkey came very close to real war. Indeed the tension remained and even in 1976 the possibility of open hostility was more than present with the entry in the Aegean archipelago of a Turkish survey ship named 'Hora' in August 1976.

No.340 Squadron was declared operational as an all-weather bomber squadron a year later. On 7 July 1976, a sister squadron No.345 became operational. Both had Close Air Support as primary, and Tactical Air Support Maritime Operations as secondary, roles. Both A-7H Corsair squadrons undertook the task of testing weapon separation from pylons of bombs as described in NAVAIR-1, tasks that were not performed easily outside a modern firing range environment.



A No.345 Sqn HAF A-7H, BuNo 159955, in front of a HAS at Larissa



Three A-7Hs in the three-tone SEA camouflage scheme applied to HAF A-7Hs overflying the Cretan mountains

In the very difficult 1975-77 period, the HAF managed to build up three A-7H squadrons. Two in Souda Bay in Crete, Nos.340 and 345 Squadrons, and No.347 Squadron at Larissa Air Base, on mainland Greece, created an arc of maximum range that could be utilised in the hypotheti-



Another almost perfect side view, this time TA-7H. BuNo 161222

cal scenario situation in which the THK made a pre-emptive strike against Greece.

All the THK air bases that were close to the Aegean coastline and some other inland ones in Asia Minor, were now within range of the A-7H Corsairs. As a precautionary step in the late 1970s Turkey bought the Rapier AAA system for the air defence of the THK aerodrome installations as well as constructing its first hardened aircraft shelters.

The introduction of modern aircraft into the HAF such as the A-7H, the F1CG Mirage and the F-4E brought a massive reshaping of the tactics that were evaluated and put in good use. The A-7H was the first aircraft in HAF service fitted with HUD and with its advanced avionics gave its pilots the opportunity to fly in IFR/IMC conditions. Gradually pilots fresh from the HAF Academy started to join these squadrons.

The very first course of the Greek version of Fighter Weapons School was conducted in 1976 for the Mirage F1CG, and F-4E interceptor pilots. In 1977 there were two more courses, this time for



An Operational Conversion Unit TA-7H, BuNo 161221

the fighter-bomber A-7H, F-104G and F-4E pilots. From 1981 Corsairs took part in the Centre of Air Tactics at Andravida Air Base and soon the Corsair squadrons participated in 'lerakas' exercises that were basically DACT practice inside the HAF Fighter squadrons.

TA-7H Corsair

As the USN did not possess a two-seat Corsair trainer, LTV built a prototype two-seat version as a private venture. Designated YA-7E/H, s/n 156801, the prototype took off with test pilot John Konrad at the controls on 29 September 1972. The USN initially adopted the TA-7H designation but as the Greek order kicked in it reverted to the TA-7C designation.



HAF Corsair 'jockeys'... this happy breed...

The YA-7E/H was the first Corsair powered by the TF-41 turbofan engine. It also lacked an air-to-air refuelling probe, simply featuring a cover on the right side, like the Greek models. In fact during the negotiations, the HAF forgot to include mention of the air-to-air refueling probe and paid a nominal price for its removal as all the A-7Hs were similar to the USN A-7E Corsair standard.

Consequently, in 1974, the USN ordered the conversion of twenty-four A-7Bs and thirty-six A-7Cs into TA-7C standards, the last one coming off the production line on 20 June 1978.

The HAF initially had only ordered Flight Simulators. However the conversion to a sophisticated attack machine is a rather complex issue, and it swiftly came to a decision to order six TA-7Hs. These were ordered in 1977 and paid off via Foreign Military Sales funds.

The first TA-7H was converted from a single seater, s/n 159664, which acted as the prototype for the two-seater versions. HAF TA-7Hs arrived in Greece from July to October 1980. Until the introduction of the TA-7H into HAF service only experienced and capable fighter pilots converted to the Corsair squadrons.

With the introduction of the TA-7H, an Operational Conversion Unit (OCU) was formed at Souda Bay Air Base for pilots fresh out of the Air Force Academy. Only the top 10% of graduates were posted to a Corsair squadron, in addition to pilots who had prior experience on aircraft such as the F-104G Starfighter and F-84F. The OCU significantly helped in the interface and the lead-in phase of these demanding missions. It also helped in the DACTs with F-4Es and F-5As during the FWS and 'lerakas' exercises – aircraft that are used by the THK.



Twin-seat TA-7H, with single-seat A-7Hs, BuNo 159917 and 159951, beyond...



A pristine A-7H in front of a HAF

During 'Iniochos' exercises in Andravida the TA-7H trainers were used with a COMAO leader in the rear seat. A secondary operation was during the Squadron Exchange (SQ/EX) detachments, that were used as 'en-route' mother ships and to give flying experience to pilots from the co-host squadrons.

Until its retirement, the Souda OCU was active from 1980 until 2001, the TA-7H doing a sterling job in preparing A-7 pilots. From then onwards the TA-7H was used by the Araxos mixed OCU until the class of 2006.

Squadron exchanges

In the 1980s with the transformation of the HAF into a 'modern' air force, Squadron Exchange training started.

From 29 June until 6 July 1979 Corsairs from No.340 Sqn visited Hahn airbase in SQ/EX with the Luftwaffe. From 17 June until 26 June 1980 four Corsairs from No.345 Sqn travelled to RAF Coltishall, in the UK, in order to take part in a SQ/EX exercise with Jaguar GR.1s of No.54 Squadron.

From 16 May until 25 May 1983 four A-7H from No.345 Sqn participated in SQ/EX with the German Navy MFG 2, (Marineflieger Geschwader 2), F-104G Starfighters based at Tarp, Eggebeck. Then from 7 to 14 June 1983 four Corsairs of No.340 Sqn visited 13th Gruppo, AMI at Brindisi, Italy, also equipped with F-104G Starfighters. In February and April 1987 two Corsairs from No.340 Sqn travelled to Grazzanise Air Base in Italy.

As well as these Squadron Exchanges, four single-seaters from No.345 Sqn and two two-seater Corsairs travelled to Italy to participate in exercise 'Dragon Hammer'. The exercise took part in Grosseto, Italy from 6 until 20 May 1992.

Another first was noted in April 1993 when Corsairs of No.340 Sqn travelled to Kleine Brogel to participate with the F-16A/B Fighting Falcons from No.23 Sqn, Force Aérienne Belge. On 3 May 1995 one TA-7H and three A-7H Corsairs from No.340 Sqn visited Majorca airport in Spain to participate in the 'Destined Glory' exercise.

A continuous co-operation of No.345 Sqn with the German Navy Tornado IDS was initiated and in two separate occasions from the 3rd until 12th May 1995, and during the summer of 2001 Squadron Exchanges were carried out with MFG 2 based at Tarp, Eggebeck.



A pair of No.340 Sqn A-7Hs, with 159950 in the foreground and 159959 to the rear, flying over the mountains

National readiness and exercises

Except for keeping a national Quick Readiness Alert commitment with different weapons configurations, 15-minute QRAs were held for interception purposes in the southern region. Also in the 1980s the use of these aircraft as primary interceptors from Crete was brought up and in two cases A-7Hs were used for the identification of two Libyan (LARAF) MiG-23 'Floggers' with their defecting pilots that landed at Maleme auxiliary airfield in Crete in April 1989.

At different times during USN carrier exercises in the Aegean Sea region, A-7Hs were used to identify USN aircraft types, (A-6E Intruders and S-3B Vikings), that were operating in the vicinity day and night. During the 1990s, the Crete-based A-7H Corsair units received a boost in the availability of the type as the influx of the newest F-16C/D with Peace Xenia I programme in 1989 and II in 1996 permitted the disbandment of the Larissa-based Squadron, and its fifteen aircraft were handed over to the Souda Bay squadrons to supplement the losses that had been growing since the 1980s.

Also four aircraft from No.347 Squadron transited initially from Araxos airbase to give 'hands-on' experience for technicians that would be soon operating the second-hand A-7E Corsairs. With the suspension of No.347 Squadron on 31 June 1992, Souda's aircraft increased to fifty-two and a steady number of aircraft missions were accounted for.

On 9 November 1994 in the primary concept use of Integrated Air Defence Region between Greece and Cyprus, four A-7H Corsairs from Souda participated in a COMAO, (COMposite Air Operation), with two F-16C Falcons, over Paphos, Cyprus in 'Exercise Nikiforos' (Victorious).

The most dramatic event of this decade took part in January 1996 when Turkey mounted a special forces operation to occupy the Imia island close by Kalolimnos area close to the Aegean Sea borders. On the night of 31 January 1996 the entire Greek Armed forces were placed on maximum alert status. Turkish special forces commando teams landed on a Greek outcrop of western Imia and a Turkish Flotilla was also present in the region. The A-7H Corsairs had orders to flatten the rocky outcrop of western Imia with bombs and during that night, in continuous rotation, four pilots had that target as a primary mission. Again, following US intervention, nothing happened except the loss of a Hellenic Navy AB-212 helicopter with its crew at around 03.00 hours in the morning in harsh weather conditions.

One of the exercises that No.340 Sqn Corsairs took part in was 'Dynamic Mix' in November 1997, with the participation of RAF Tornados and USN carrier presence in the area of Ionian sea. In that exercise the HAF Corsairs took part in a strike package force that attacked the aircraft carrier USS John F Kennedy CV-67.

The A-7E Corsair

With the entry of the A-7E Corsair into service with HAF, the differences of the 'H' variant came under scrutiny and it was evident that despite the fact that the 'H' models were built in 1975 and 1976, the A-7E models were far more advanced despite their age and 'salty operations' background!

With the new defense budget cuts of the PASOK government it was decided to re-equip Nos.340 and 343 squadrons with the F-16C/D block 52+ planned for sometime in mid-2003. Thus Nos.340 and 345 Squadron operations were suspended in 2001 and during the summer of 2002 respectively, and all of the surviving aircraft were handed over to No.336 Squadron in Araxos. The Squadron found itself with some forty aircraft to operate. It was a rather herculean task for a single airbase to perform maintenance and to keep logistics properly for a fleet of so many Corsairs. Araxos Air Base became the Corsair 'mother base' and an important part of the southeastern Mediterranean region.

"On the night of 31 January 1996 the entire Greek Armed forces were placed on maximum alert status..."



Around-the-clock views of A-7H, BuNo 159937, of No.347 Sqn HAF, photographed at Xronia in February 2007....



The thirty-six single-seat and five two-seaters continued to performed flawlessly and in 2004 the type was certified to operate and drop the AFDS, (Autonomous Free-flight Dispenser System), of EADS. The aircraft performed primarily in its role as attack and fulfilled a secondary mission, that of LIFT, (Lead in Fighter-Trainer). This role is about preparing HAF Academy pilot graduates in building up their flying hours and transiting to the different blocks of F-16s that are used in Air Defence squadrons, a role that had started in 1990 right after the F-5A/B retirement from HAF in 2001.

The last exercise that HAF A-7H Corsairs took part in was of 'Spartan Hammer 06' at Andravida Air Base during December 2006. During April 2007 the HAF Leadership elected to retire the older Corsairs and to re-equip No.336 Squadron with the A-7E version. All the aircraft, thirty-four A-7Hs and five TA-7Hs – (except one two-seater and two sin-



The first A-7H Corsair, BuNo 159662, delivered to No.340 Sqn HAF in August 1975

gle-seaters that are in the HAF Museum at Dekelia and Souda Air Base acting as gate guardians) – were flown into Agrinion Air Base for permanent storage as war reserve!

Accidents

About twenty A-7H Corsairs have been lost over the thirty years of service with HAF. As the detailed analysis of every accident is beyond the scope of this article, suffice to say most of the accidents took place during low-level bombing exercises and were being flown by new pilots that had graduated from the HAF Academy. Thirteen pilots perished during these years in service with Nos.340, 345 and 347 Squadrons.

One of the most tragic accidents occurred when a two-ship formation of A-7H Corsairs from No.347 Sqn impacted in a mountain side of north-east Greece during an Instrument Meteorological



Close-up of the well-weathered nose of an OCU TA-7H

"... the A-7E models were far more advanced despite their age and 'salty operations' background!"

Condition exercise on 11 September 1985. Another dramatic accident in recent HAF history occurred at Souda Bay, when another two-ship formation was taking off for an attack exercise on the morning of 16 May 2000. Due to a fault in one of the aircraft's wing folding mechanism, during take off, the outboard wing section folded and the 340 Squadron A-7H rolled over and crashed.

No.340 'Fox' Squadron

The Squadron was formed on 13 April 1953 at Eleusis air base, on Republic F-84G Thunderjets. On 23 August 1953 it relocated to Nea Aghialos air base. Due to foxes visiting the squadron's premises from the nearby hills and mountains, the Squadron was soon nicknamed 'Fox' Squadron. During 1956 it participated in the Gun-nery Meeting held in Italy. In May 1959 the Thunderjets were replaced and the squadron was re-equipped with another version from Republic, the F-84F Thunderstreak.



Pre-flight inspection of an OCU A-7H at Souda Bay

On 4 February 1960 the squadron moved to its new home-base at Souda Bay, Crete. No.340 Sqn has taken part in numerous NATO exercises. In May and September 1960 it took part in 'Regex' and 'Flashback' exercises. During July 1961 six F-84Fs from No.340 Sqn were detached to Balikesir aerodrome in Turkey as part of NATO SQ/EX.

On 24 July 1962 four F-84Fs visited Rimini as part of SQEX. During 1965 the squadron was evaluated and scored highly in the LABS bombing technique, after which in 1967 it was placed in 'A' category amongst the Strike squadrons of NATO.

In March 1970 it sent a detachment of four aircraft to Gioia del Colle to participate in the 'Round Flag' exercise, as well as a formation of four F-84Fs taking part in a SQ/EX in Ghendi. After a competition inside the HAF for the selection of a squadron that would participate in Exercise 'Best Hit', the squadron scored highly at the annual gunnery meeting for 1972 and it was considered the best standard F-84F HAF squadron. The same was repeated in 1973.

On 30 June 1974, F-84Fs from No.338 Sqn were handed over to the resident No.340 Fighter Bomber Squadron bringing the total figure to seventy-five aircraft. From 31 August 1975, No.340 Sqn started its transformation as an A-7H all-weather bomber squadron, giving away its F-84Fs to No.345 Squadron. During July 1976 the squadron was declared 'Combat Ready'. In its twenty-six year lifespan as an A-7H Corsair operator No.340 Squadron lost five pilots to accidents.

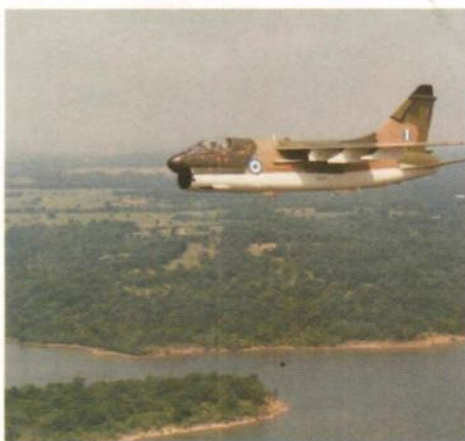
On 30 January 2001 the squadron was disbanded and gave its aircraft to No.345 Squadron. It was re-established on 3 March 2003 in preparation for the entry of the F-16C/D block 52+ into HAF service. No.340 'Fox' Squadron focused right from the start on night operations utilising the LANTIRN pod.

No.345 'Laelaps' Squadron

On 2 August 1975 a Flight of No.340 Sqn was renamed as the new No.345 Sqn, equipped with F-84F Thunderstreaks based at Kastelli aerodrome in eastern Crete. In fact prior to it being officially allocated its squadron designation, on 18 July

A-7H Corsair II, BuNo 159966 of No.340 Sqn, winter 2001

BuNo 159966 as it appeared during the ceremony for the disbandment of No.340 Mira Vomvardismou in the winter of 2001. A HAF fin flash and the Bureau Number were added on the fin of the aircraft later (profile: G Psarras)



No.347 Sq HAF A-7H on exercise in Germany in the late 1990s

1974, this embryonic detachment with twenty F-84Fs was ordered to depart for Kastelli airbase and prepare for wartime operations.

During the Turkish sea invasion of Cyprus on the morning of 20 July 1974, these F-84Fs were ready to participate in a daring mission over Kerineia, Cyprus. They were fully loaded with two fuel tanks, two 500lb bombs and four 2.75 inch rockets as well as with a full load of ammunition for their six 0.50 inch Colt machine guns. Although they never took off in anger, the detachment stood by in readiness until September 1974.

On 13 September 1975, No.345 Sqn moved from Larissa airbase to Souda Bay. On 23 February 1976, the squadron was reformed at Souda with

twenty A-7H/TA-7H Corsairs. On 7 July 1976 No.345 Squadron became operational as an all-weather bomber squadron. Thus Nos 340 and 345 Squadrons started up together in the training of operational missions.

During August 2002 the squadron was disbanded in order to allow for the formation in Souda of No.343 'Star' Squadron focused on the SEAD mission and day/night (NVG) air defence, armed with an assortment of AGM-88B HARM and AIM-120C-5 AMRAAM missiles. Thus No.345 Squadron started transferring the forty A-7H/TA-7H Corsairs to No.336 Squadron at Araxos airbase. During the twenty-six years of continuous Corsair operations the squadron lost four pilots.

No.347 'Perseus' Squadron

The history of No.347 Squadron epitomises the story of the post-war HAF as it was reformed from the ashes and hardships of World War Two. No.347 Flight was formed on April 1946 at Larissa airbase as a Taylorcraft Auster and Harvard operator in the Greek Civil War and was utilised in the AOP and Forward Air Control roles. In fact RHAF was the first, worldwide, operator utilising Harvard Mk IIA/Bs and Spitfire Mk IXs and XVIs together in the Close Air Support role.

No.347 Flight was disbanded right after the civil war ended in 1950, but was reformed as a full Squadron on 20 July 1974 equipped with F-84F Thunderstreaks at the KEA facilities in Hellinikon, manned by active and reserve pilots during the Cyprus crisis of 1974.



A-7H, BuNo 159966 of No.340 Sqn as it appeared for the disbandment of the unit in the winter of 2001

It remained active in Larissa airbase until 1 February 1977 when it was re-established at Souda. It was then equipped with the A-7H Corsair and moved to Larissa Air Base on 10 June 1977 and was declared as Combat Ready in September 1977.

No.347 Sqn was disbanded on 31 June 1992 and the squadron personnel were distributed to other Corsair Squadrons in Araxos. In July 1997 it was reformed, this time in Nea Aghialos airbase in the outskirts of Volos with twenty F-16C/D block 50 Fighting Falcons. Since then the squadron has taken part in numerous NATO exercises and Squadron exchanges including Exercise 'Dynamic Mix' in Greece.

The F-16C/D block 50 aircraft are equipped with LANTIRN pods that brought over night-attack capability with Laser Bombs and AGM-65G Maverick missiles. The squadron reached national and international headlines as two of the unit's 'readiness' F-16Cs were ordered to intercept the Boeing 737-300 of Helios that crashed in the Grammatiko hills on Sunday 14 August 2005. **MAH**



A-7H Corsair, BuNo 159956 under a thunderous mediterranean sky...



The Little Prince's Last Flight

Saint-Exupéry's F-5b

Tony Grand describes Antoine de Saint-Exupéry's last flight and models his aircraft in 1/32 scale...

It was a beautiful July day on Corsica. In heavily accented English, the pilot of the Lockheed F-5B Lightning on the runway at Borgo, asked, "Colgate from Dressdown number six. Permission to taxi and take off?" From the control tower came the reply, "OK number six, you can taxi and take off." So went the last known exchange between the pilot, author and philosopher Antoine de Saint-Exupéry, and another human being.

According to the operational record of the strategic reconnaissance unit, Groupe II/33 de Grande Reconnaissance, (a Free French unit operating under the aegis of the USAAF), Saint-Ex, (as he was commonly known), took off at 9.00am on 31 July 1944 for a photographic mission over southern France. He should have returned by 1.00pm. When he did not return by 2.30pm, when his fuel would have run out, his comrades knew there was no hope and, indeed, he was never seen again.

Parts of the wreckage of his aircraft, serial number 42-68223, (the aircraft's serial number is in the operational record), were found in 2003 in the Mediterranean off Marseilles, and have been authenticated by the National Air and Space Museum, in Washington DC. The cause of his death has been speculated on for years.

As I write this, the causes for Saint-Ex's disappearance include oxygen starvation, shot down by

the Luftwaffe and suicide. All have their adherents. I suspect that this 44 year-old, overweight heavy smoker, flying a 'hot ship', that normally no-one over 35 would pilot, probably had a heart-attack. His father died at the same age of just that.



Although his words to his friends in the days before his death show a certain despair about the future and show that, like the 'Little Prince', the hero of his fable for children, he was ready to leave this world, I do not believe he took his own life. But he must have known that the odds against him were shortening.

As something of a devotee of Saint-Ex's work. (my sons say obsessive...). and an aircraft modeller, it was inevitable that I would eventually model the aircraft in which he took his final flight. The conversion from a P-38 fighter to the F-5B reconnaissance variant which I describe below is based on the Revell 1/32 scale P-38J which I had 'in stock' in the loft when I began the project.

I know the Trumpeter P-38L is also now available, and there are aftermarket resin sets available for this conversion, however, given the choice of hacking away at a model I had 'in stock' (approx £15-25.00's worth of kit according to Kingkit's current range of prices for the Revell kit), and £68.00's worth, (Hannants' price for the Trumpeter offering), I know which I'd choose...

This is both a conversion and a detailing exercise. It includes a fair amount of scratchbuilding, as well as parts of a number of after-market sets, which have become available over the five and a half years since I began work on it. There were a lot of interruptions...

A word about the kit

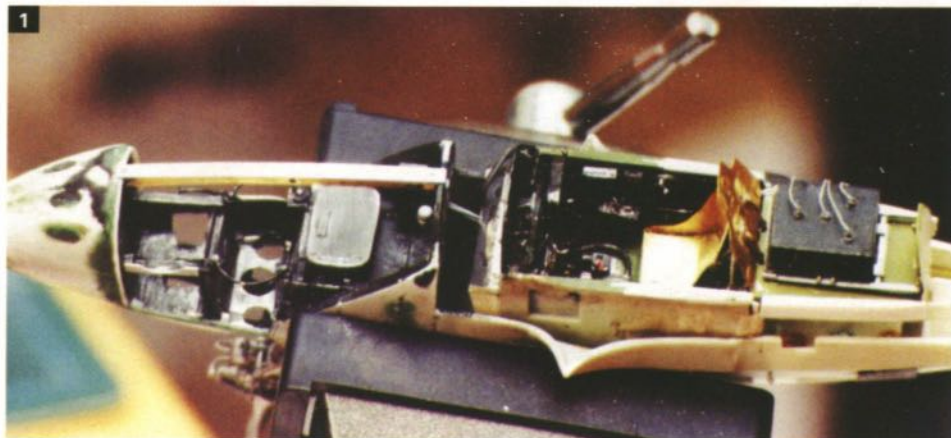
The Revell kit dates back to the 1970s and has since been reissued several times. The one I worked on was a 1980 stamping, issued as a straightforward P-38J. The outline is quite accurate, having one or two really nice touches, like the upsweep on the lower surface of the wingtips. One exception to this accuracy is the cross-section of the engine nacelles – they are much too flat.

So far as more detailed aspects are concerned, the kit falls short just of where you would expect for one of about 1970: namely the undercarriage wells, (very rudimentary); the undercarriage itself, (lacking in detail and rather weak); the engine, (one only is supplied, rather squashed in cross-section, which I suspect can be accommodated within the rather thick nacelle walls – but that thick and rather forgiving plastic is, however, very useful when it comes to carving the kit about!); heavy rivet detail, which I sanded off; and, finally, the cockpit, which is pretty sparse.

Concerning the accuracy of available scale plans... and tons of reference material

I'm no rivet-counter but, if you're doing major improvement work like this, I think it's worth checking the kit against a set of plans. And, again, as the profile of the nose is being altered, as you must to make an F-5B from a P-38J, good references are essential. Easier said than done, as some widely available plans are incorrect in some major areas of the P-38.

The best overall plans I found to be the old Scale Modeller ones, (still available, if you search on the Web), and those in the Monografie Lotnicze book. But you can't beat photos of the real thing and a good eye to work some things out and that goes for the reshaping of the P-38 nose to accommodate the panels for the cameras on the F-5B.



- ment panel on F-5B)
- Detail and Scale Vol 58 'P-38 Lightning Part 2', (especially good for photos of cameras)
- Walk Around No.30 'P-38 Lightning', (very good on engine detail and cameras)
- 'P-38 Lightning in World War II Color'
- Monografie Lotnicze 70 'Lockheed P-38 Lightning Part 3', (good detail photos and plans)
- 'Poet and Pilot: Antoine de Saint-Exupéry' – three weeks in the life of Groupe II/33', photographs by John Phillips lots of Saint-Ex)
- 'Les P-38 de la 33e Escadre' Les Ailes de Gloire No 16. This is the latest book (2004). With this book in your possession, a good set of plans, (and perhaps this article...), you'd be a long way to being able to do this build.

Pilot's Nacelle

As I didn't envisage writing an article when this build started, photos are somewhat sparse from the beginning. Accordingly, some of my illustrative photos come from later in the build. And I must

waves saws and a scalpel, I cut out the apertures for the camera ports. As I cut out the last one, the poor, over-stressed plastic collapsed and, after one of those, 'I'm binning this' moments, I had to set to with superglue and rebuild it from the shards of plastic...

The photo-compartment doors were made by thinning down the panels cut from the kit; then cutting holes in these, to represent the strengthening shapes pressed into the doors' inner panels, and finally gluing these pieces to outer panels made from aluminium shim, (see photo 21 for the finished products).

Placard holders were fitted, as on the original, made by Reheat in my case. I made the hinges by putting large staples through holes in square-section brass tubing, that I'd used for the thin section joining the nose-cap to immediately in front of the cockpit. I built up an imitation of the springs on these, (using coiled fuse-wire), that keep the doors open, (see photo 22)

The protruding section of each staple fits snugly into a U-section channel fixed to the door, just about visible in photo 21.

Cockpit (Photo 2)

I used the Waldron P-38 cockpit set for this. It offers nice instruments and panel fronts but leaves the modeller to scratchbuild boxes for radios etc. If I were doing the job again, I would use Jerry Rutman's set, with it's nice detail. I eventually used Jerry Rutman's radios and the frame on which they rest, having acquired them part way through the build after previously building my own. The F-5B had a few extra instruments on its panel compared to the P-38J, as detailed in the Pilot's Notes. These were made from scrap and Waldron instruments.



Camera Bay (Photo 3)

You're basically on your own with the detail in here. I used photo interpretation, as it were, to guess (intelligently!) at what kind of structure was necessary to support the cameras and the size, shape etc of what seems to be some kind of relay box at the rear of the bay. The photos of the most

This is a conversion and a detailing exercise, with some scratchbuilding and after-market sets...



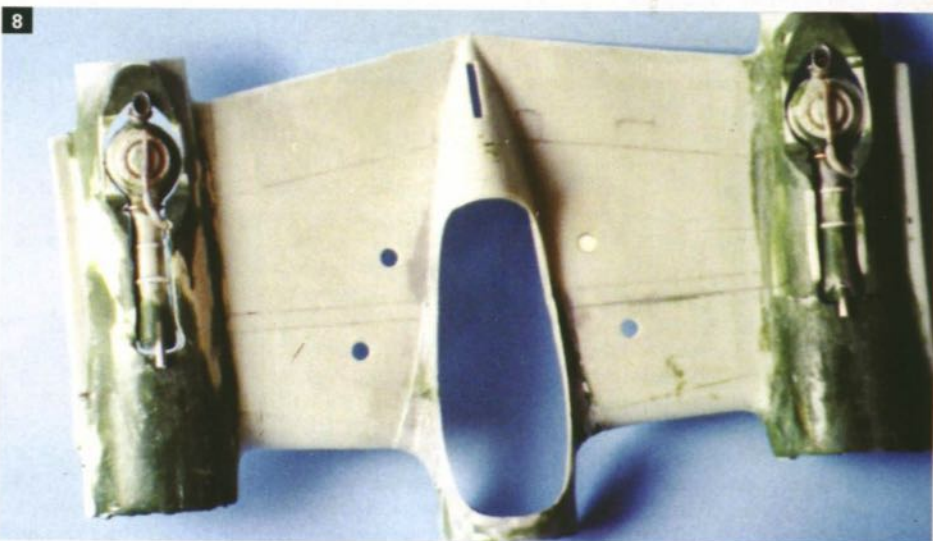
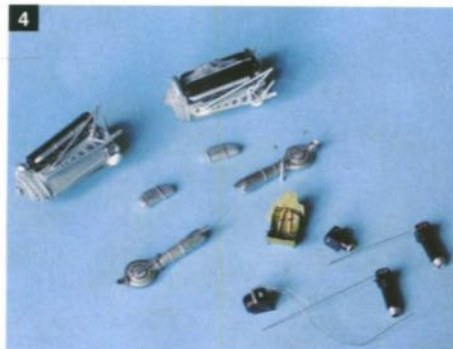
It's quite subtle and I have not found a single plan which gives it accurately, (not even in the recent 'Ailes de Gloire' volume referenced below). On my elder son's suggestion, I did it by eye, working from photos, of which there are plenty. As I worked on the project over a period of time, progressively more books on the P-38 have appeared and as I've acquired most of them, I'm prepared to stick my neck out and say which I think are most useful. This is my 'short' list:

- Aero Detail 28 'Lockheed P-38L' (for details of preserved aircraft)
- Pilot's Flight Operating Instructions for Army Models P-38H Series, P-38J-5 and F-5B-1, (for cockpit detail, especially differences in instru-

apologise in advance for the variable photo quality. This build was done before I quite gripped what was needed for lighting and backgrounds, and there is a marked colour cast on some pictures.

Nose

Photo 1 shows the pilot's nacelle at quite an advanced stage; cockpit fitted and crucially, large chunks of the nose cut away to represent the camera compartment and ports. It was in doing the latter that I came unstuck. Using a large razor saw, I first cut out the panels, (most of the nose between the nose-cap and just forward of the cockpit), which enclose what will be the camera compartment and then, using the miniature Air-



use were those in the Walkround, p51 and Detail and Scale, pp57 and 59. Those in the D&S, whilst of an F-5E and an F-5F, give good details of the cameras. The photos in the recently published Ailes de Gloire volume are of great assistance too.

Four cameras, (amongst other scratchbuilt items in photo 4), were made from scrap plastic, some aluminium tube and pieces of wire, whilst the fifth, just a 'dummy' end of lens, can be seen in photo 5, peeping through one of the camera ports.

All this work could be avoided by replacing the kit's nose with one of the two, solid, resin recce noses available as aftermarket items. One is by, again, Jerry Rutman. I have not seen this but the photos of the other, by Contact Résine, (meant for the Trumpeter kit, although that shouldn't present a problem), in a Hyperscale

review, show beautiful detail. However, I'm not totally sure about that profile...

Next on the nacelle is detailing the nosewheel bay, using wire and plastic tube for the electrics and hydraulics. (I decided to use the kit nosewheel bay and Jerry Rutman's mainwheel bays). To simulate the rivets on the bay walls I made indentations in thin brass shim and glued this in with Evostik. (I did the same with the mainwheel bays). So that I could secure it properly, I added the nosewheel leg at this stage, scratchbuilding the leg as such and the struts from aluminium tube and using the 'fork' from Jerry Rutman's undercarriage set for strength. I used photos for the references for all this. (photo 6).

I decided to paint the undercarriage bays Zinc Chromate, although there is discussion surround-

ing this, as there is concerning the use of Interior Green for the cockpit. I went with the consensus on both and used them. Also at this time, I opened up the slots for the pilot's ladder and added formation lights - for the latter drilling out holes where the kit has raised markings, adding sections of appropriately painted transparent plastic rod behind them and a surround made from thin shim (photo 7).

Wings and booms

Photo 8 shows the cockpit surround/wing inner section sub-component, with the engine nacelle cross-section built up with scrap plastic and Squadron Green Stuff, using a reference from the Monografie Lotnicze plans. (Also visible are the turbo-superchargers, much modified from the kit



items, with reference to photos. See also photo 4). Photo 9 shows this section in place and also shows the wing fillet, which is entirely missing from the kit. It's a bit noticeable if you miss it off! I built that area up from plastic strip and Green Stuff, eventually making the fillet itself with pewter – (see below for technique).

Photo 10 shows one of Jerry Rutman's main undercarriage wells before final assembly. This is a chunky piece of resin, designed to take Jerry's white metal version of the kit undercarriage leg. As I had decided to model the legs as closely as possible to the originals, and this meant adding extra struts, I had to cut out some resin at the forward end, to accommodate these. I detailed the bays referring to photos.

To fit the bays, you have to perform surgery on both the booms, (taking out the layer of plastic above the undercarriage bay), and the wings, (removing the 'web' connecting the inner and outer sections of the lower wing halves). This didn't do a lot for the strength of the joints between the outer wings and the booms/engine nacelles but superglue and scrap plastic helped a little.

As I'd decided to build the model with most of the engine panels removed, I took away a lot of plastic from the engine area but left what corresponds to the lower panels – both to act as a support for the engines and on which to fit the engine nacelle fronts. The poor, butchered result can be seen in photo 11, with the fronts of the undercarriage bays protruding.

15



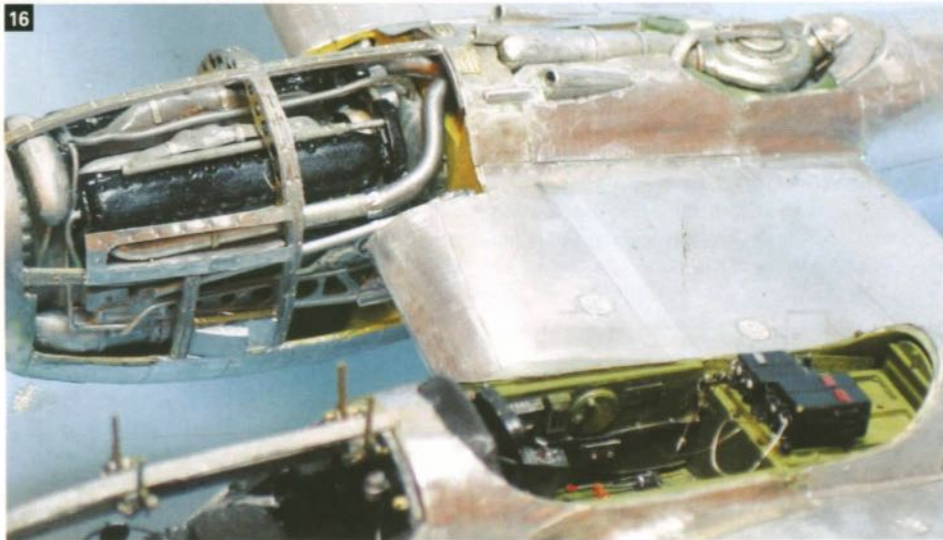
My reference, and I regard it as authoritative, is the side view in the French periodical *Icare*, No.96, (1981), pp186-187, labelled as being produced following the archives of Saint-Exupéry's commanding officer, René Gavaille.

I decided to follow master modeller Alan Clark and actually use metal. I used .005 inch aluminium shim; Bare-Metal foil; aluminium self-adhe-

metal finish aircraft as being painted aluminium, (leading edges etc). I don't know if that is prototypical, so I've not done it. It's difficult to tell from the available, contemporary photos. By the way, I started to apply rivets but decided very soon that from the viewing distance on my display shelf, it wasn't worth it.

"Four cameras were made from scrap plastic, some aluminium tube and pieces of wire..."

16



The removal of the areas which Revell designed to lock the booms and wings nicely together, makes getting the booms properly aligned quite an interesting task! I did some work on the engine radiators, putting some metal mesh, (liberated from a cafetière!), fore and aft inside them and replacing the kit flaps on the items with metal shim.

Natural metal finish

You may have noticed that the model looks quite shiny in some pictures. Well, that's because of the way I decided to render the natural metal finish on this F-5B.

I went for a natural metal finish despite assertions that the finish was Synthetic Haze or PR Blue.

sive tape, (the metal is .03mm but the adhesive makes it not much thinner than the shim); and .005 inch pewter sheet. The pewter was particularly useful for the wing-root fillets, as it is so malleable. This covering process continued until the end of the build. Photo 12 shows it well under way. The aluminium and pewter were stuck down with Thixofix, (as it doesn't 'grab' instantly and allows you to adjust things. But I discovered too late that it attacks polystyrene. A coat of Johnson's Klear (Future across the Pond) on the plastic acts as a protective barrier. Later, I used Evostik for smaller items.)

The metal was applied following the panel lines of the original, as far as was practicable. The Monografie plans show large areas of natural

The engines

The kit gives you one, rather emaciated, engine. I 'bulked this out' by putting polystyrene sheet between the halves and enlarged the cylinder head covers. I made a mould from this modified piece in silicon rubber (RTV) and then cast a duplicate in resin. Photo 13 shows the engines, (with the turbo-superchargers and oil tanks), after painting. Medium grey and black seem to be accurate and photo 14 shows them after further detailing, using plastic and metal tubing, wire and wire mesh.

The turbo-superchargers were heavily modified from the kit items. The engine bearers for one engine came from the kit, plus modifications working from photos and I scratchbuilt those for the other. I cut down the engine nacelle fronts a little but they are deeper from back to front than they should be.

Compromise was necessary to provide the necessary strength to carry the engines and provide attachment points for the 'plumbing'. Photo 15 shows both engines in place and work begun on the formers for the panels. For this I used fine, (1mm x 1mm), U-section brass girder from Kittle Hobby of Swansea, formed according to the cross-sections in *Monografie Lotnicze*, drilled to represent fastener holes and thin brass shim added, with holes punched out, to simulate the deeper, lightened, sections. Photo 16 shows the starboard engine, formers complete, with grilles, air intakes and turbo-superchargers in place.

Cockpit canopy

I am prepared to be proved wrong, but I believe Saint-Ex's machine, 42-68223, to have had the curved windscreen of P-38s up to and including early in the 'J' series. (A photo of F-5B 42-68225 shows the same, I think. This is in *Monografie*, p22). This means changing the kit's flat windscreen.

I tried fettling it but, after failure, decided to splash out on, (again – no, I don't have shares –



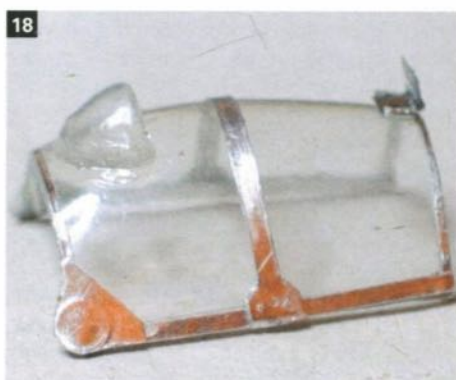
he's just good!), Jerry Rutman's conversion kit for variants of the P-38 earlier than the 'J'. The delicate, clear, vacformed canopy, after cutting up, (front, rear and centre hinging and sliding sections), needed support and I decided to provide frames, reflecting the prototype, from Kittle 1mm x 1mm square brass rod. (See Photo 2 again.)

Photo 17 shows the front and rear portions in place, additional framing having been made from adhesive aluminium tape. Photo 18 shows the hinging section, (the bulge on top fairing the rear-view mirror liberated from the kit canopy), after framing. The hinge at the actually rear works! The last time I'll try anything like that... Photo 19 shows the side panels in place, with more aluminium strip for framing and bracing.



Undercarriage

At this stage, I added the undercarriage doors, using the kit doors with lightening holes drilled; an outer layer of aluminium added; hinges added from an Eduard set intended for the Trumpeter kit; and hydraulic actuators scratchbuilt – (see photos 11 and 20). The undercarriage itself was added at an earlier stage, being fixed in very firmly, because of the weight it has to take, with all that resin and metal. The mainwheels came from Jerry Rutman, (because of the tyre tread), but the nosewheel was from the Revell kit, as Jerry's wheel seemed over-size, according to the official data.



Paints and decals

As you may see, external painting on this model is at a minimum. The propellers and anti-glare panels on the nose and on the limited area of the nacelles which remains as I've modelled the model. The propellers were painted black with yellow tips, (although photos show that not all Lightnings had the latter), and the anti-glare areas Olive Drab, using Humbrol 155, as recommended in an article I can't remember where or by whom, after an in-depth comparison of representations of this apparently much argued over colour.

After all that research, my latest information showed that the anti-glare areas might well have been black! (No, I'm not going to repaint!) The Icare picture referred to previously doesn't show the extreme nose and the spinners forward of the propellers painted in red, unlike the other machines in the Escadre. That would seem unusual but I continued to follow that lead. I subsequently saw that the Ailes de Gloire volume doesn't have it, either.

The decal story is rather more complicated. I tried enlarging, (courtesy of a photocopy shop), the 1/48 scale Third Group decal sheet for several F-5s of GR II/33 onto plain decal sheet but they turned out to be thick and fragile. (I knew how they feel, after all this...) The only salvageable parts were the fin flashes. The 1/48 originals are rather nice, with splendid notes. The rest of the problem I broke down, as follows:

• Roundels

I used Model Art 1/72 scale roundels, with white side-bars cut from plain decal sheet.

• Numbers

The Third Group sheet has 'broken', stencil-type serials, although this doesn't show on the Icare side view. What I did, given that photos in Icare, (and subsequently in Ailes de Gloire), showed quite a variation in style for the serial numbers, was to find Letraset sheets with a font close to that of the numbers on a photo of René Gavoille's machine 42-68233. (By the way, in this computer age, good old Letraset is only available in very restricted sets). To get the serials lined up, as rubbing down the individual numbers can be a pain, I rubbed them down onto clear decal sheet, then applied the whole serial as one decal. (Photo 22, nose serial)

• Other decals

SuperScale sheets 32-201 and 32-126 provided stencils, 'No Step's, fuel cap surrounds etc. but I couldn't use their manufacturer's logos on the propeller blades, as they are printed in black... to go on black blades? Doh! The decals from Revell proved to be quite acceptable, although a little out of register. By the way, Klear/Future proved to be as effective an 'undercoat' for bare metal as for 'solid' paintwork.

Final touches

All the photos of F-5s in GR II/33 show them with DF loops immediately aft of the nosewheel bay and I duly manufactured one, with a bomb nose cap from the spares box and fuse wire. The large mast on the forward fuselage has to be mounted on top of the nose, rather than below as on the fighter variant. I used the kit item. The antenna wires stretching from cockpit canopy to tail fins were made from very fine stainless steel wire. (Photos 23 and 24)

I made sure that I fitted the propellers on the correct engine nacelles, as they're handed. The pilot's ladder was made from scrap plastic. A fine coat of satin varnish was applied to protect the decals and further tone down the shine of the natural



25



"I went for a natural metal finish despite assertions that the finish was Synthetic Haze or PR Blue..."

metal and then the final act was fitting the cameras, with associated wiring (lead wire and fuse-wire) – photo 25.

Well, not quite the final act, as I had to fit a discreet length of transparent plastic rod, to the outside of the lower part of the starboard tail fin, to support the model and prevent it being a tail-sitter... Difficult to put weight in the nose, (except a very little, right forward), and all that resin in the



undercarriage bays is wrongly distributed around the point of balance for my purposes! I suppose I could have cast the cameras in lead...

The machine should have underwing drop tanks but I've not found anyone who makes these. (Photos 26 onwards show the completed model.

Well, that's it, my own little homage to Saint-Ex, some 60 years after his death. Apart from that, for me, one of the main things was that it taught me new skills and generally stretched me as a modeller. I must confess that I wouldn't normally, in a build, go to the lengths I did in this, but this was special... MAM





Note the inert weaponry, and the rear-facing camera in its orange under nose-fairing

SEPECAT's Sea Cat

Andy Evans reveals the story of the would-be carrier based Jaguar

The Jaguar M, (for Marine/Maritime), was a 'one-off' – a single-seat prototype built to fulfil a French Aeronavale requirement for an aircraft to replace the Dassault Étendard IV. The story was then brought full circle with the radar equipped Indian Maritime Jaguar IM, a sobering thought of what might have been, had the navalised Jaguar project not been cancelled.

M for Maritime

The Jaguar M was a unique aircraft, and one slated to possess excellent attack capabilities together with twin engines for operational safety. Based on the promise of what the proposed Jaguar production aircraft could achieve, in early 1967 some fifty examples were earmarked to be shaped for maritime use. Of these, forty would be single-seat strike/reconnaissance aircraft and ten would be land-based two-seat trainers.

Built by Breguet, Jaguar M-05 was to be the single maritime prototype and carrying the civil registration F-ZWRJ and the code letter 'J' on its intakes, the aircraft completed its maiden flight

on 14 November 1969 from the airfield at Melun-Villaroche.

The main visible difference between the Armée de l'Air Jaguar A and Navalised M was in its undercarriage. The naval version had a smaller, twin nosewheel unit and larger, single mainwheels in order to facilitate catapult launches and arrested landings. The undercarriage legs were also different. The mainwheel structure emerged almost per-

pendicularly from the wheel wells, unlike on the land-based models, whilst the legs were more angled, giving the aircraft a somewhat squat stance. The undercarriage units themselves were suitably strengthened to withstand a higher sink rate on landing, and the nosewheel gained a telescopic oleo to give the aircraft the correct angle of attack for catapult launches from the smaller French aircraft carriers.

It is interesting to note that whilst the nosewheel doors were built for the Jaguar M, they were seldom fitted, especially during the trials phase, and these doors had a different shape to those of the other prototypes. The arrestor hook, which had a far thicker section than the 'overshoot hook' on the land-based Jaguar, was stressed to withstand 5.5g and had a much stronger root fairing between the engine exhaust nozzles, and catapult strop attachment points were located on the fuselage underside, forward of the mainwheel doors.

Other general structural strengthening was undertaken to give the Jaguar M's airframe the ability to withstand catapult forces and, since it



The undercarriage units themselves were suitably strengthened to withstand a higher sink rate on landing



The Jaguar M comes to a halt after 'taking the wire' aboard Clemenceau



The catapult strop falls into the sea as the Jaguar M clears the bow

was a prototype, the aircraft also sported the intake splitter plates that were deleted on the production Jaguar.

Avionics were similar to those fitted to the Jaguar A, with the addition of a laser rangefinder in the nose. Martin-Baker provided a Mk 9 zero/zero ejection seat and provision was made for twin 30mm DEFA cannon, although the external cannon ports were actually faired over, and evidence suggests that the guns were never fitted. A retractable in-flight refuelling probe was fitted beneath the windshield and the Jaguar M was also intended to carry a 'buddy-buddy' aerial refuelling pack.

The prototype itself was not 'navalised' to any great degree as plans were well advanced for the introduction of components that would be resistant to saltwater corrosion on the production aircraft. The Jaguar M prototype also began life with the original shorter fin, but was retrofitted with the taller 'production' fin before undertaking sea trials, and the designers also took the opportunity to fit



Framed by the crash barrier, the Jaguar M reveals its nose applied 'mission' markings and perforated airbrakes

"... in early 1967 some fifty Jaguar Ms were earmarked for maritime use..."

the aircraft with re-styled, 'kinked' stabilisers at the same time. Also, the airbrakes of the Jaguar M featured four rows of perforations, rather than the two rows found on the land-based prototypes.

On 20 April 1970 the aircraft was flown across the English Channel to the Royal Aircraft Establishment at Bedford for initial deck-landing trials. The Jaguar M development team made use of the RAE's land-based dummy deck, which was a fully-equipped catapult track built on raised steel girders to simulate the 'cat-shots' experienced on a real aircraft carrier.

On 8 July 1970 the Jaguar M began sea trials aboard the French aircraft carrier Clemenceau, and

between 8 and 13 July it conducted a total of twelve catapult-assisted launches, (using full reheat), and arrested landings, as well as undertaking deck-handling assessment and compatibility tests. For the carrier launches, a series of coloured lights were added to the Jaguar's nosewheel leg and these were contained in a white oblong box, the lights being used to observe the aircraft's launch characteristics. A rearward-facing test camera was also installed in an orange fairing on the fuselage underside, directly beneath the cockpit area; similarly, a forward-looking camera was mounted on the rear underfuselage, just ahead of the engine access bays.

Despite the Jaguar M's many impressive qualities, the French Navy was unhappy with the aircraft's cost, which meant that it could only afford fifty fighters, rather than the 100 aircraft it required, and subsequently the French government cancelled the Jaguar M in January 1973.

The main reason for abandoning the project? The Navy expressed their "dissatisfaction with the single-engine recovery characteristics of the aircraft, which gave insufficient recovery power in the case of one engine shutting down during deck landings." Their solution, *Aéronavale* would receive the single-engined Dassault Super Étendard, and the navy's fifty-aircraft Jaguar allocation would be transferred to the Armée de l'Air. However it must also be noted that the French also cited the degree of modification required to their carriers to handle the Jaguar M would also be



Full reheat is applied as the Jaguar M prepares for launch from Clemenceau



A rare colour shot of the Jaguar M during sea trials aboard Clemenceau



Caught just as it crosses the fantail en-route to catch the arrestor wire aboard Clemenceau



A successful trap!

high. The Jaguar M was then relegated to test flying after the project's cancellation and made its last flight on 12 December 1975.

The prototype Jaguar M was painted in a typical a French Navy scheme of gloss dark blue/grey upper surfaces and gloss white lower surfaces, the upper surface colour wrapping around the underside of the wing leading edges. White also featured on the underwing pylons and underfuselage strakes. Aéronavale roundels were located above and below the wings and on the rear fuselage sides, with the stylised 'Jaguar' logo applied to the nose, and with 'SEPECAT Jaguar' and 'M-05' stencilled on the tail fin.

On each side of the nose were a number of red, white and blue markings denoting the number of sorties undertaken by the aircraft. Rescue and warning markings were applied in full colour, with captive trials weaponry being blue and fuel tanks silver.

During its time aboard Clemenceau the Jaguar M also gained an all-white rudder with four hori-

zontal golden-yellow stripes applied across it, with the latter colour also being added to the braking parachute housing below. The intakes also sported the insignia of the Clemenceau and were 'zapped' with badges of the carrier's resident Étendard squadrons, (including 14F), plus the emblem of the RAE.

During its visit to RAE Bedford as part of its trials phase, the Jaguar M wore broad, (approximately 30cm/12 inch wide), red, white and blue stripes painted from behind the cockpit to just behind the second of the auxiliary inlet doors, across the top of the wings and fuselage and across the rear fuselage from just behind the roundel to the mid-section of the ventral fins. The tail received a large, crudely painted French roundel, and the nose carried the patriotic legend '14 July 1789' (Bastille Day) in red.

"A maritime version of the Jaguar is currently operated by the Indian Air Force..."

The Indian Way – The Maritime Shamsheer

A maritime version of the Jaguar, albeit land-based, is currently operated by the Indian Air Force, and is a prime example of 'what could have been' had the Jaguar M been truly developed. The IM version of the Jaguar, the existence of which was once denied by the IAF, incorporates a nose-mounted Agave radar installation, an unadopted option for the original Jaguar International. The Agave, which is also fitted to the Dassault Super Étendard carrier-based strike aircraft, was originally tested as an underfuselage podded accessory; however, the IAF had other plans for the stores stations, and the radar was therefore fitted within a sharp nose radome, the fit having been tested previously in a modified RAE Canberra. The Agave radar, which dramatically alters the Jaguar's profile, necessitating the relocation of the nose-



After land-based trials at RAE Bedford, the Jaguar M was flown to the Clemenceau



The Jaguar M is prepared for launch at RAE Bedford



The Jaguar M's initial carrier take-off and landing trials were conducted from the RAE at Bedford, making use of the resident dummy carrier deck



Coming in to land at RAE Bedford. Note the faired-over cannon ports and the lack of a nosewheel door



Currently the Jaguar IM's wear the same overall Medium Sea Grey scheme applied to the Indian Jaguar IS force (© Simon Watson)



The Indian Jaguar IM – with its Agave radar nose

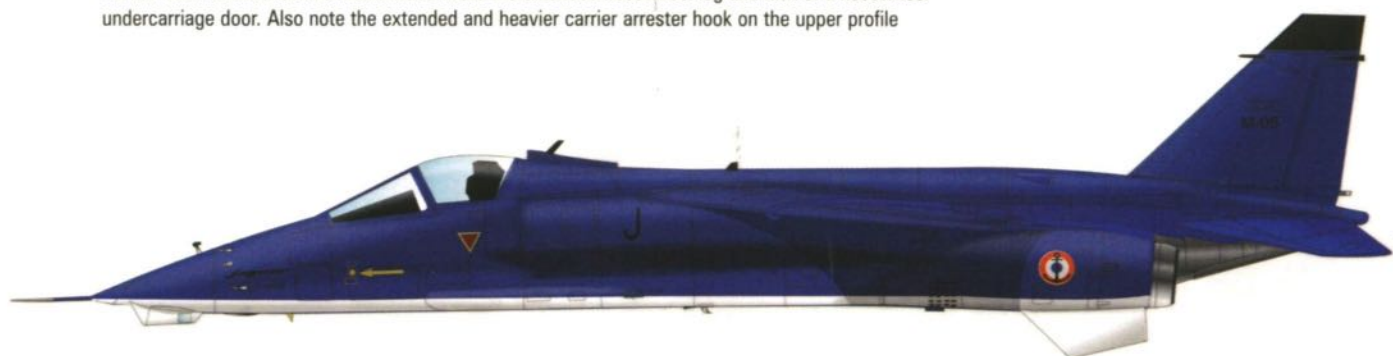


The IM Jaguars carry the code range JM251 to JM262 (© Simon Watson)



Jaguar M Prototype, F-ZWRJ, M-05, 'J', November 1969

Finished in French Naval blue/grey with white undersides, with the civil registration and 'M-05' code on the fin and code letter 'J' on the intake sides. Note the extended nosewheel leg and lack of a nosewheel undercarriage door. Also note the extended and heavier carrier arrester hook on the upper profile



Jaguar International IM, JM255, No.6 Squadron, Indian Air Force, circa 1980

JM255 is illustrated wearing the circa 1980s two-tone wraparound camouflage scheme of Dark Sea Grey and Light Aircraft Grey



Jaguar International IM, JM257, No.6 Squadron, Indian Air Force, circa 2000

JM257 is illustrated wearing the current overall Medium Sea Grey scheme





The two camouflage schemes used by the Indian Jaguars are evident here (© Simon Watson)

mounted pitot tube, gives an idea of what the cancelled Jaguar M might finally have looked like.

The Agave has a range of around 80 miles (130 km) against a typical ship target and around 17 miles (28 km) against a fighter-sized target. A dual-mode, (air-to-air and air-to-surface), radar, the Agave is interfaced with the DARIN nav/attack system and can be complemented via the addition of an underfuselage mounting for a single Sea Eagle, Harpoon or Kormoran anti-ship missile, with a pair of 264 Imperial gallon fuel tanks normally carried on the inner wing pylons. For short-range mis-



A line up of No.6 Sqn Indian Air Force Jaguar IM's (© Simon Watson)

"The first Jaguar IM variant flew in 1985 and was handed over to the IAF in January 1986..."

sions, the aircraft is also reported to be capable of carrying a pair of anti-ship missiles on the inner wing pylons, with a single tank on the centreline.

The first Jaguar IM variant flew in 1985 and was handed over to the IAF in January 1986, with six examples having been delivered by December 1992, followed by a further two in mid-1993, all of which were converted from the original production batch.

Of the eight aircraft that were initially converted by HAL to Jaguar IM standard, one of their number was lost due to handling difficulties experienced during development trials. A further five air-

craft were later reconfigured, bringing the IAF's maritime Jaguar complement to twelve, carrying the code range JM251 to JM262.

In 1996, a contract was signed with Elta to upgrade the maritime attack variant with the EL/M-2032 multimode fire control radar. Ten EL/M-2032 radars are to be supplied. The IM aircraft will also be installed with integrated electronic warfare pods.

The maritime version initially formed 'A' Flight within No.6 'Dragons' Squadron, a composite unit based at Pune. The Jaguar element was assigned to strike duties, whilst 'B' Flight operat-

ed the Canberra B(I).12 for maritime reconnaissance. Since 1992, both flights have operated the Jaguar. In 2007, the Squadron moved to Jamnagar to allow Pune to become an exclusive Sukhoi Su-30 airbase.

Original camouflage for the maritime variant comprised an 'over-water' wraparound scheme, with disruptive light blue/grey and dark blue/grey areas, a black anti-glare panel and fin tip, and black codes, the last three digits being repeated in saffron red on the nosewheel door. Currently the Jaguar IM's wear the same overall Medium Sea Grey scheme applied to the Indian Jaguar IS force. The Jaguar IM remains unique to the IAF, although at one time Nigeria was reported to have expressed an interest in acquiring six such aircraft. **MAM**



The IM version of the Jaguar, the existence of which was once denied by the IAF, incorporates a nose-mounted Agave radar installation, an unadopted option for the original Jaguar International (© Simon Watson)



Queen o'the Boats

Len Thomson builds the 1/72 scale Airfix kit as a Sunderland Mk V

The RAF has had a long history of flying boat use. From the early days at the end of World War I when the service was formed by the amalgamation of the RFC and RNAS, the RAF had been using flying boats for coastal patrol and for policing the seaways of the Empire. I suppose the ultimate expression of British flying boat power is the Short Sunderland.

Short Brothers of Rochester designed the S.23 'C' Class flying boat in the 1930s and this aircraft was well used in civilian hands. A military design was also promulgated at the same time, using similar construction methods. This called for a four-engined, general purpose, flying boat to replace the Short Singapore. Short's chief designer was Arthur Gouge.

The prototype S.25 Sunderland, K4774, was launched from the slipway at Rochester on 14 October 1937. It was powered by four Bristol Pegasus X radial engines and the first flight was made two days later. Service entry was in mid-1938 when L2159 was flown to Seletar to join No.210 Squadron.

The Sunderland was built in five Marks – the

original Mark I, (Pegasus XXII), which had single Vickers 'K' guns in dorsal hatches; the Mark II, (Pegasus XVII), introduced in 1941 featured a two gun dorsal turret; the most produced, (462 boats), Sunderland Mark III, which introduced the faired main planing step which improved performance in the air and featured ASV radar as standard; the Mk IV, (or Seaford), powered by Bristol Hercules engines, of which relatively few were built; and the ultimate Sunderland, the Mark V.

The Sunderland Mk V was powered by Pratt and Whitney Twin Wasp engines, which had already been tried by No.10 Sqn RAAF, and first flew in late 1944. This Mark had a greater range, due to the new engines, and featured ASV Mark IV centimetric radar in scanner under the wings as standard.

The last RAF Sunderlands were taken out of service in May 1959. Highlights of this magnificent machine's service were the Battle of the Atlantic, coastal attacks in Burma, service during the Berlin Airlift when it was found to be ideal for carrying salt, a bombing role during the Malayan Emergency, relief of HMS Amethyst in the Yangtze Incident, reconnaissance duties in the Korean War,

and support of the British North Greenland Expedition in 1954.

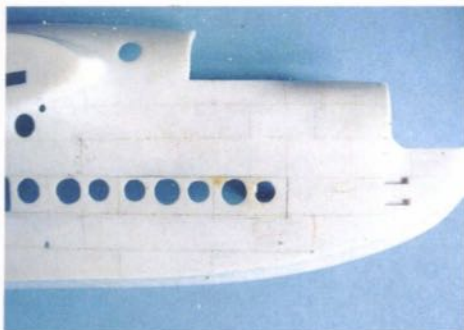
Modelling the monster

In 1/72 scale, the only game in town is the 1960 vintage Airfix kit of the Sunderland Mk III. I had tried to make a model of this aircraft a few years ago, failed miserably, and put it away. I then invested in another kit, with plans for another try sometime.

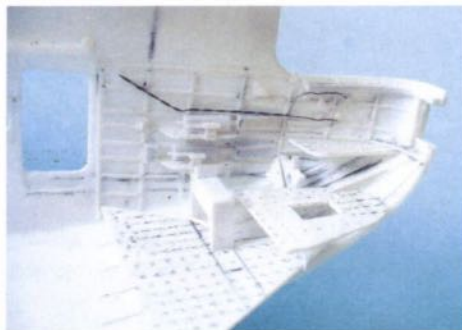
When the time came to try again I had already paid several visits to the RAF Museum at Hendon and IWM Duxford and had photographed the two examples extensively, both inside and out. In view of all this material, I decided to build a Sunderland Mk V. The changes necessary to the kit were as follows – new engines with different cowlings, centimetric radar under the wings, new front and rear turrets, beam hatches for 0.50 inch Browning machine guns and several other minor differences.

Making a start – the fuselage

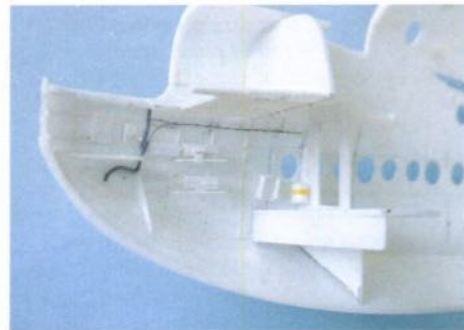
With all the photographs in my possession, it seemed like a waste not to put most of the interior shots to good use. Once I had arranged all the



Reducing the size of the fuselage windows



Building up the area around the front turret



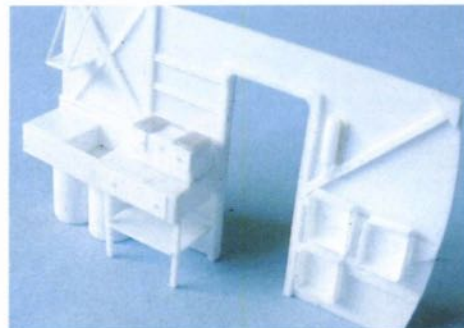
Looking aft towards the cockpit area



The rear fuselage... including the Elsan!



Fitting in the bulkheads



One of the bulkheads

photos into a logical order, (I had taken them over the course of many visits), I was able to work out where almost everything went.

Work commenced by sanding away all the rivet and panel line detail on the fuselage sides. It is nicely restrained as it stands, but with the punishment the kit parts were going to take, it had to go in order to provide a consistent surface on which to work. I had two sets of plans in my library, those from the Warpaint volume on the Sunderland, which I found to be a little inaccurate in places, and the 1/144 drawings in Osprey's 'Sunderland Units of World War Two'. By careful reference to the plans, and to photographs, I was able to ascertain the position of the front and rear doors, galley/drogue hatches and the beam gun hatches. These were marked and cut out of the hull sides.

One of the main problems with the Airfix Sunderland is that the hull windows are moulded too big. Something had to be done. I had already decided that full interior detail would be added to the model, and this would be better served by having thinner sides where the windows were. The method I used may seem drastic, but it worked. The whole window area of each hull side was removed, with the cut lines just above and below the window line. I tried to keep the cut-outs as square as possible. Next, a strip of 20 thou plastic was cut and fitted into each side to close the gap. This had to be as good a fit as possible so that there were no gaps. The joints were filled with CA glue, and when set, were gently sanded so that no trace remained.

Each window position was then measured and marked. Using small drills and a round file, each window was then cut to the correct size. Some were filed to a slightly larger circumference where the portholes would be left open. I have a feeling that my portholes are still slightly too big, but they look better than the kit mouldings.

I then began the job of rescribing the panel lines. On looking at the scale plans, it appears that some of the lengthwise lines are curved upwards towards the tail. This would cause immense problems in rescribing due to the compound curves

involved. My method to overcome this was to simply use straight lines for each panel, changing the angle slightly each time so that the panels tapered correctly upwards towards the tail. A really flexible scribing guide was a godsend during this exercise.

I find it helpful when rescribing to find a couple of lines which can be used as a datum. For example, there is a fairly prominent joint line vertically around the rear fuselage, and the panel just above and below the windows. Once these have been marked and scribed, most other panels can be measured using dividers, marked and scribed.

Once the scribing was complete, each half was rubbed down with 'wet & dry', and washed to clear out any sanding residue. I scribed the wing joint around the wing stubs moulded on the fuselage by hand, very carefully trying to keep to the joint line. I needed several attempts before I was happy.

On the inside of each hull half, the plastic was

Interior – lower deck

I commenced work by detailing the nose anchor and mooring compartment. Everything was fabricated from plastic card with the drainage holes being drilled out after cutting. Supports for the various floor levels were cut from thicker card which was shaped to match the profile of the hull bottom. I had to do a lot of trial fitting to both sides to ensure that everything would go together afterwards. I had already cut out the ports for the four 0.303 inch Browning machine guns, so a representation was made of the breeches and their mountings, together with the ammunition boxes. The compartment sides were detailed with thin plastic card cut into strips for ribs and stringers, together with stretched sprue and wire. The anchor winch was made up from plastic card and left out until after painting.

The front bulkhead was cut from 20 thou card and trial fitted, along with the floor for the front

"The Sunderland was built in five Marks – I, II, III, IV and the ultimate Sunderland, the Mk V..."

ground away with a motor tool around the joints with the plastic card window strip, and gently scraped with a curved scalpel blade until a fairly uniform thickness was achieved. The openings for the various hatches and doors were also thinned.

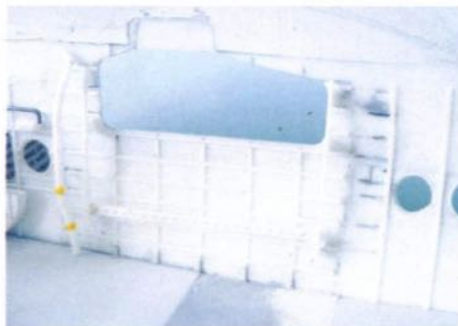
The kit features large mouldings at the wing roots. These were filled with plastic card and Milliput and sanded smooth. A representation of the framework in these parts was made by drilling and careful cutting. At this stage, I had intended to model an aircraft without the mid-upper turret so the opening was closed with plastic card and made good.

I had always intended to display the model with the front turret retracted for mooring, and so the overscale mountings for the front turret were cut away as well. The position of the upper portholes were marked and cut-outs made in the fuselage top. The upper escape hatch was to be shown removed, and this was also marked and cut out.

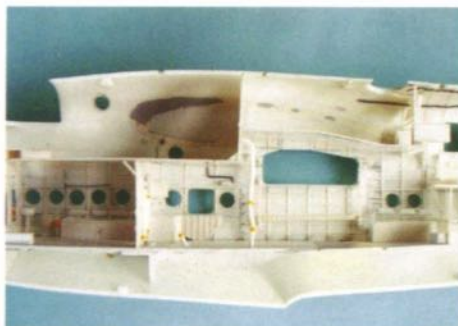
turret mount. This first bulkhead does not stretch all the way across the hull and has the door for the toilet and access to the steps to the flight deck. I then built the steps and the bulkhead which would be the front part of the officers' mess.

The floor of the lower deck was cut from thicker (40 thou), card and after lots of trial fitting, trimming, more trial fitting, more trimming etc, until I was happy with the fit and the fact that it was level. This was not easy to judge due to nothing on the Sunderland's exterior being either horizontal or vertical! The floor was added to one side using CA to ensure a firm joint. This floor piece stretched as far as the rear of the bomb compartment.

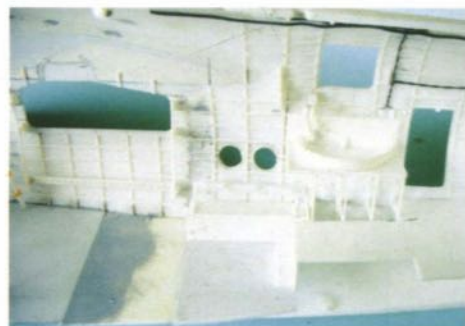
Due to the way I had constructed all of this front part of the lower deck, I was lucky enough to be able to 'clip fit' the toilet/mess bulkheads into place to ensure all was well. A representation of the toilet, wash basin and pipework was added to the 'heads'.



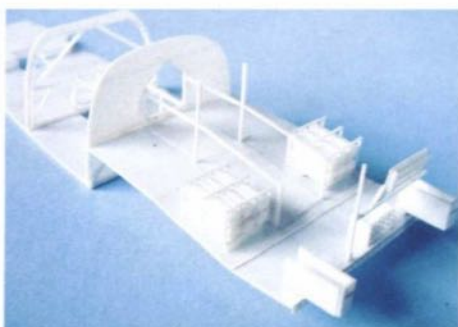
Detailing the depth charge bay



An overall view of the fuselage interior under construction



Close-up of the rear fuselage wall detail



Building up the cockpit and flight deck area



The cockpit and flight deck area taking shape



Time for the interior to be painted

It was now a case of building each compartment, one by one. The officers' mess had seats along each side, with a table in the middle. I built the first set of seats onto the floor and hull side, with the other being built purely on the hull side, at the correct height so that they would rest on the floor to make later painting easier. A representation of the seat framework was added to the top with 5 thou plastic card on top to represent the seat fabric. The hull sides were detailed with plastic card and wire as before to represent the ribs, stringers and seat supports. Another bulkhead was cut out and it was time for the galley. It is very important to ensure that all the bulkheads were of the same height as the upper deck would rest on this in time.

At either side of the galley are the semi-circular stowage bins for the manoeuvring drogues. These were made from cut-out plastic card and suitably detailed with stretched sprue. All of the

kitchen equipment was built from plastic card and oddments and kept out of the model for painting separately.

Working rearwards, we come to the bomb compartment. The sides were detailed as before, and I made a representation of the mechanism used to lower the hatches through which the bomb carriers were winched. I made new hatches from thin plastic card, with portholes suitably drilled, and detailed with strip. This compartment has a higher roof in order to reach the bottom surface of the wing. Because of the large size of the hatches, I wanted to show a detailed roof with the bomb mechanism. This would be done with the construction of the upper deck.

After yet another bulkhead, which features a cut-out with a roll up canvas curtain, I had now reached the point of modelling the rear compartment. The first job was to ascertain the position of the different levels of floor. The first section is level

with the forward floor, and then there is a step up to the rear section which slopes gently up to the tail. I also measured the position of the gun platforms so that cut-outs could be made for their supports. Once again, there were some subtle curves to take into consideration. When I was satisfied with the shape, the floors were added and detail could begin on the fuselage sides.

Careful study of photographs showed where the main features were and these included the usual ribs and stringers, gun positions etc. It was then that I realised that I had cut the rear entrance in the wrong place! Aaaargh!

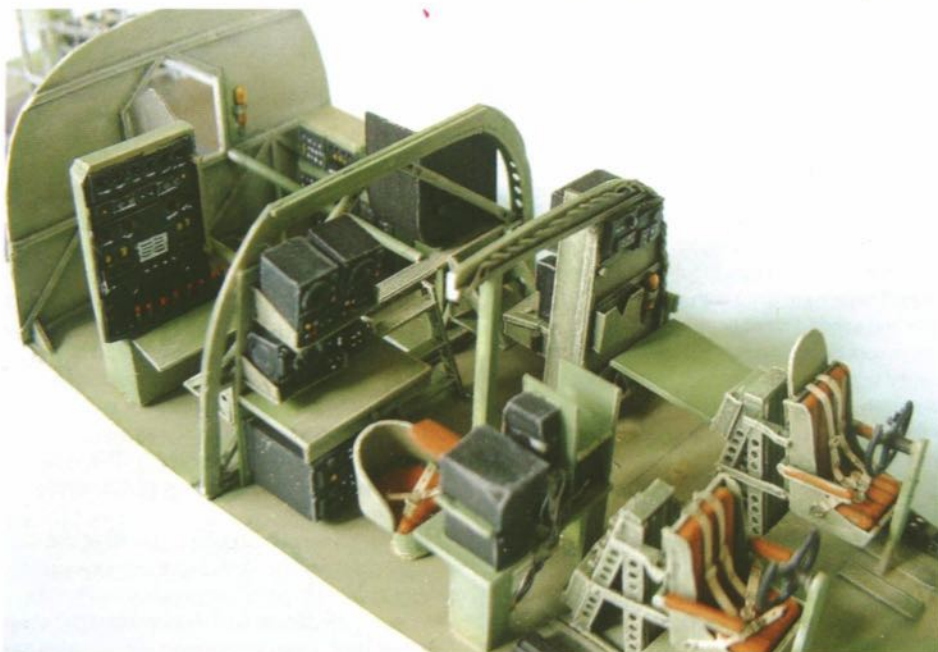
The door was filled and recut in the correct place. The gun platforms were built using sections of the kit's engine cowlings cut and carved to shape. They had just the circumference I was looking for. The platform supports and gun mountings were added from strips of 10 thou card and rod etc.

Various ancillary details were added working rearwards, including wiring, the workbench with a vice, stowed oars, parachute stowage and the frames where the work platforms were stowed. The further to the rear I went, the detail I added became sparser as it would be harder to see through the various openings. At all times during this construction, the fuselage sides were trial fitted together to ensure all was well.

Interior - upper deck

The first job was to cut out the shape of the upper deck. Once again it was done slowly and surely, with much trimming and trial fitting until I was satisfied. The rear part, aft of the flight engineer's station was raised, (remember that higher roof for the bomb compartment?) There is a bulkhead at this point with a small door which was cut to shape, (more trial fitting), and added. The rear part of the upper deck is in three parts to represent the sloping section.

At the very rear were the ammunition boxes for the 0.50 calibre beam guns. These project slightly beyond the end of the floor and rest on mountings on the hull sides. I made the boxes from card, mounted them on the floor and with a



Close up of the painted cockpit and flight deck area

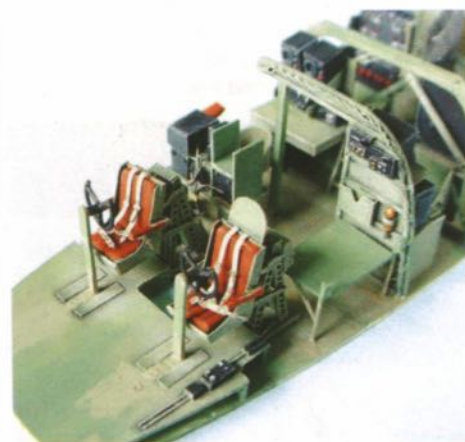
great deal of luck found that when the upper deck was placed in position, the boxes fitted nicely onto these supports. I had the main framework of the upper deck done. Holes were measured and cut out for access from the front stairwell and from the ladder in the galley.

It was now a case of simply building in all the details, working rearwards. An instrument panel and throttle pedestal was cut from plastic card, and scratchbuilt seats were made. Then the half bulkhead was cut out to fit the fuselage sides. At the point where the main spar crosses the fuselage, I made a representation of the spar and its framework above. The various equipment for the crew stations was all built from plastic card. These included the ASV station, wireless operator's radios and desk, navigator's station, flight engineer's panel and sundry seats. All were left off for painting separately.

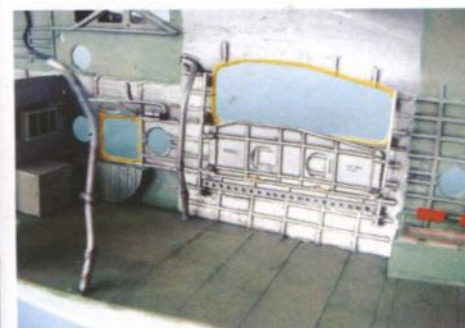
The roof of the bomb bay compartment was detailed with cut plastic card and various thicknesses of wire and an attempt was made to model the rails on which the bomb carriers were suspended. Coming topsides again, I added some detail to the rear of the upper deck which included flare and sonobouy stowage and the protective framework around the mid upper turret. I had by this time decided to have this turret and the opening was cut out again!

Interior painting

Much of the interior of the Sunderland was painted aluminium. For this, I used Citadel paints' Chainmail. I thinned it with Tamiya thinners and airbrushed all the relevant areas. Due to the amount of detail on the fuselage sides, I found it very difficult to suitably mask these areas so that the Interior Grey/Green could be painted. I therefore brush painted this entire colour. Note that the officers' mess and galley, whilst in the main aluminium, have grey/green at the bottom of the walls.



The cockpit and flight deck area after painting



Note the 'natural metal' walls around the depth charge bay

All the other parts which had been left off the model were painted at the same time. These were the various doors, bomb hatches, crew equipment and seats, bulkheads etc, etc. All areas were given a wash with a thin very dark grey and dry brushed with lightened versions of the relevant base colours. I find it useful when painting, where acrylic paint has been used, to add the wash from thinned enamel paint, and where the base is enamel, to wash with thinned acrylic. This avoids the risk of the thinned paint lifting the base coat. For the aluminium areas, highlighting was done with Citadel Mithril Silver. Detail painting was carried out in the relevant colours, with the usual washing and dry brushing.

It was then time to assemble all the upper deck fittings to their relevant places, and try to fit everything together.

"I find it helpful when rescribing to find a couple of lines which can be used as a datum..."

Main fuselage and empennage

I was lucky. It all fitted together reasonably well! Due to the age of the moulds, the fuselage halves did not match as well as with more modern kits, and quite a bit of filling and rubbing down was required, particularly along the spine. Milliput was used for this job and after rubbing down, it was coated with Mr Surfacer and again rubbed down. The accompanying photographs show how much work was involved here. Any lost panel lines were subsequently restored.

I wanted to show the panels on the planing bottom better than 'as moulded' with raised rivets and panel lines. Scribing would be difficult if not impossible with the compound curves. I tried a few times but failed miserably. Then I hit upon the idea of reskinning the bottom with individual plates. I used 5 thou plastic card with the dimensions of each plate being measured using

dividers from the scale plans. It was still necessary to introduce some curved edges to some panels but I was able to do this reasonably easily. Once the whole thing had been reskinned, I gave it a rub down with fine wet and dry paper to remove any raised edges etc. I had to tidy up some parts with Mr Surfacer but it came out reasonably well in the end.

Some modification and detailing was also needed to other parts of the fuselage. I will go through these from front to back, or should that be from stern to stern?

The bomb aimer's window was slightly larger on the Sunderland Mk V. I opened up and squared off the kit window and added a frame with some details from thin plastic card.

The part of the fuselage into which the front turret retracts is not particularly well moulded.



Overall view of the fuselage interior after painting



Close up of the painted mid-fuselage section



Close up of the painted nose turret area



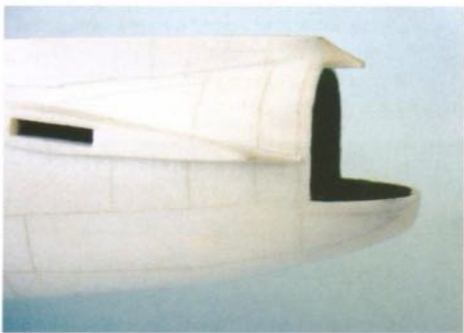
The replaced (sic) mid-upper turret fairing



The nose turret bay



Rescribed hull chine area



Reshaped rear turret area



Rescribing the wing upper surface panelling



Starting work on the rudder and elevator 'fabric'

inside of the coaming was painted to match the rest of the cockpit. I added a scratchbuilt roof console to the inside of the canopy and fixed it in place. I still had to some fairing-in at one side and this was done with Mr Surfacer and very gently sanded to make it good.

The removable hatch with the astrodome was cut to the correct shape and mounting holes, for the various aerials, DF loop etc, were drilled for later mounting of these items.

The surround for the mid-upper turret as moulded in the kit is rather too deep. I filled the bottom of the kit parts with Milliput and, when it was hardened, filed and sanded these parts to a better depth. These were then added fore and aft of the turret opening. The beam gun hatches had small wind deflectors just in front of the hatch openings. I made these from 5 thou card bent to shape. It is necessary to cut these to the fuselage profile before fixing and this was done with a very sharp scalpel blade.

The kit parts for the tail fin and tailplane are not too badly shaped. I sanded them smooth and rescribed the panels. After the parts were together and dried out, I cut slots for the elevator and rudder hinges. The hinges were made from 20 thou card sanded to the correct shape after they were firmly fixed. There are prominent trim tabs on both the elevators and rudder of the Sunderland. The location of these was marked and suitable apertures cut out. The tabs themselves were shaped plastic card and were fixed at the opposite deflection to the elevators and rudder.

The tailplane and fin were fixed to the fuselage and all seams filled with Milliput followed by Mr Surfacer and made good. I also slightly modified the rear fuselage profile with Milliput and added a warning light.

New engines

The Sunderland Mk V was fitted with Pratt and Whitney Twin Wasp engines. This meant that new cowlings were required for the model. I did some research and found that the diameter of the Pegasus engine of the Mk III was slightly less than the diameter of the Twin Wasp. In 1/72 scale these

work out to 17mm and 19.5mm respectively. I very much doubt that the nacelles of the real aircraft were changed during the initial conversion of the Sunderland Mk III to the Mk V. So I elected to leave the nacelles and find new cowlings.

Quickboost have a set of the correct style cowlings in resin for the Academy Catalina and I thought they would fit the bill. However, they are of a much smaller diameter and would not fit the kit engine nacelles which are 20mm.

First of all I tried to modify a cowling from an Academy B-17 Fortress by extending it rearwards and adding separate cooling gills. It was okay, but I did not like the finished result. I then had another look at the kit items. They are moulded from very thick plastic and would stand a fair bit of 'punishment'.

The first job was to remove the moulded-on

cooling gills by cutting and sanding. I then removed the moulded engine relief using a motor tool and opened up the cowling front opening. The inside of the cowling front was also thinned down with the motor tool and everything was sanded smooth. The engine access panels were scribed around the outside.

There is a very prominent intake scoop for the carburettor at the top of the cowling opening. I tried several times to cut and shape plastic card for this and was unsuccessful each time. In the end, I simply made two saw cuts into the cowling at the relevant place and slid some plastic card in to represent the sides of the scoop. A curved piece of card was then added to finish it off. Once all was dry, I simply sanded down any protruding plastic card on the outside of the cowling and made good.

I cut the cooling gills from a single strip of 5 thou card which was scored to represent the individual gills. This was then carefully glued around the circumference at the rear, ensuring the correct cowling length was retained. Note that the gills do

not extend across the top of the cowling. The cowling itself is extended to the rear edge of the gills at this point. I represented this by fixing a piece of thin plastic card from the rear edge of the front ring to the rear edge of the gills. This was then sanded down gently to remove the prominence of the joint. All of this is easier to do than to describe!

Once the cooling gills were set, (I had to some filling with Mr Surfacer where the liquid poly had distorted the gills), the remaining panel lines were scribed into the cowling. Now repeat this another three times.

The engines themselves were Quickboost Twin Wasps, intended for the Italeri Dakota. They fitted into the modified cowlings like a dream. Although I am a great fan of scratchbuilding my own stuff, radial engines are beyond me. I love Quickboost

engines – they are well moulded and reasonably cheap. I wanted to have one of the cowlings open and found an Aires resin Twin Wasp which of course is moulded in full rather than to a backing piece like Quickboost. I used some thin rod to represent the pushrods at the front of each engine cylinder, and added some thin wire for the ignition harness.

I painted each engine with Citadel Chainmail, and after this was dry, added a wash of thinned matt black to bring out the detail. The pushrods were painted semi-gloss black. Once inside the cowlings, the engines looked pretty good.

The propellers were Aeroclub white metal items.

Wing modification

The first thing I found about the kit wings was that the flap and aileron hinge lines are in the wrong place! I filled the flap lines with super glue and sanded them smooth. I added some square section tube to the leading edge for the oil cooler intakes to give a better impression of depth. The

"Once the white was on, copious masking was needed before the Extra Dark Sea Grey could be applied..."

kit ailerons were assembled and when dry were given a severe rubbing down to reduce their thickness. They were then added to the wing and the joints filled with Milliput. When all was sanded down, I had a couple of nice smooth wings. Once again, it was time for the scribe.

I found a decent datum line near the wingtip and a line which was more or less continuous along the wing length. Once these had been marked and scribed, it was back to measuring with dividers, scribing, correcting(!) and rubbing down. This included the hinged leading edge panels which doubled as engine inspection platforms. Note that these are of different sizes around each nacelle, and the upper line follows the leading edge whilst the lower, hinge line is at right angles to the line of flight. This enables them to hinge downwards properly. I cut out the two platforms at the nacelle which would have the open engine panel and added some pipework and structure detail inside.

I cut the shape of each wing fuel tank from plastic card by reference to plans and used these as a template for scribing. Cut-outs were made on the wingtips for the navigation lights.

On the underside of the wings, I filled the slots for the working sliding bomb carriers with plastic card. I was then able to cut more scale slots where the bomb carriers would eventually go. These were measured against each fuselage side wing stub and matching slots were made in these.

The last jobs on the wings were to open the slots for the oil cooler vents and add some shrouds around them from 5 thou card.

I found that the modified cowlings did not fit too well to the moulded nacelles. I solved this by wrapping a strip of thickish plastic card around the step at the leading edge of the nacelle. When dry it was sanded down to restore the profile of the nacelle, with a slight radius at the leading edge and the circular section in front view. This enabled me to fit the cowlings reasonably well. I left the cowlings off until the wings were fixed so that I could get the proper angles.

The exhausts of the Mk V were of a fishtail shape, and there were two per engine – nothing



like the 'hedgehog' manifolds of the Pegasus engined variants. By studying photos, I could see that these did not project directly from the top of the nacelle, but there was a small flap plate slightly below the surface from which the exhausts emerged. The position of these was measured and a suitable slot was cut out into which I let some 10 thou card which had the exhaust holes drilled.

The wings were now complete. I did however find that when offered to the fuselage, they were at a slightly lower level than the moulded stubs. This was easily cured by cutting the locating slots slightly bigger at the top.

When I was satisfied, the wings were added to the fuselage and all joints filled and rubbed down. Panel lines were then restored where they had disappeared.

The control surfaces of the Sunderland were fabric covered and no trace of the moulded representation of this remained where I had done all that sanding. I tried something new this time rather than my tried and tested stretched sprue. I marked the position of each rib and sprayed a fair-

ly heavy coat of acrylic paint on. When the masking was removed, each part was given a very gently sanding with 20000 grit. This left just an impression of the raised rib which would hopefully show through the final paint coat.

The radomes for the H2S scanners were constructed from a cruciform of plastic card which was cut to match the bottom shape, the profile and front view. All gaps were filled with plastic scrap and copiously covered with Milliput. Some time with the wet and dry resulted in two complete radomes which could be added to the wing. I then drilled some 0.30mm holes for the float rigging wires and for the radar altimeter 'T' aerials which would be added later.

The engine cowlings were carefully added ensuring that they were at the correct angle to the wing and to the line of flight.

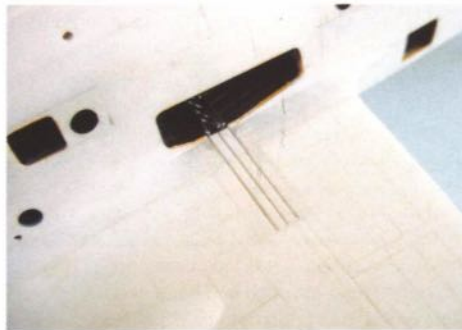
The wings were now practically complete.

Wing floats and beaching gear

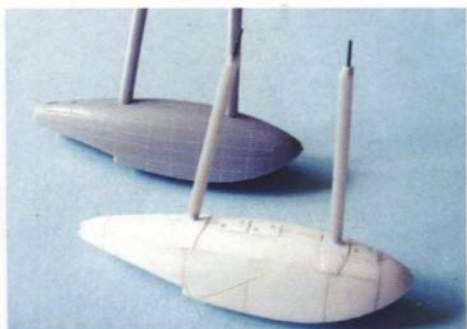
I assembled the wing floats and sanded them smooth. I then scribed in the main panel lines, (more compound curves), and improved their



... which were eventually fixed in place on the wing



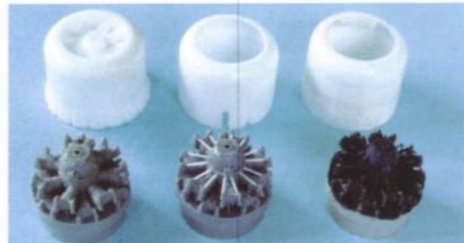
Adding the runners to the depth charge racks



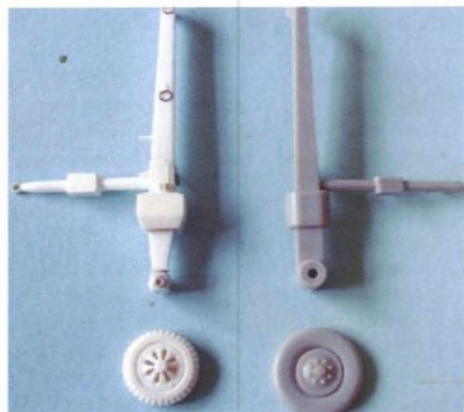
The wingtip floats – before and after modification



One of the H2S fairings built up plastic card and Milliput



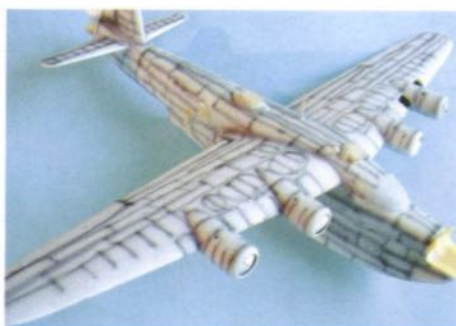
Evolution of the engines and nacelles...



The modified and the original kit beaching gear parts



The wing leading edge open engine inspection platforms and open cowling panels



Start of the pre-shading process



The beaching gear painted up and ready for fitting



Rear, front and mid-upper turrets under construction

shape at the rear where there is a mooring eye. Some inspection panels were cut from 5 thou card and added to the top surfaces. The kit struts are somewhat lacking in aerofoil shape so I replaced these with plastic strut material from Aeroclub. Before fixing the struts in place, the ends were drilled and short lengths of wire were inserted to provide a strong joint.

I was lucky enough to find some decent drawings of the main beaching gear on-line and modified the kit parts to better represent the shape. This involved changing the oval section part with a square shape built up from plastic card, (note that these were wooden to help the beaching gear float when it was being manoeuvred into place), adding lifting eyes from wire etc.

I used wheels from an Airfix Emergency set. The Sunderland kit hubs were modified by drilling small holes around the circumference, then slightly smaller holes around the hub centre. These holes were then joined with a sharp scalpel and when all was cleaned up they looked more like the 'spoked' wheel hubs on the real thing. The hubs fitted the 'refugee' wheels like a dream.

The moulded locating pins were retained so that I could simply slip the gear onto the model so that it would sit straight and level on the bench. The rear beaching trolley was practically a total rebuild using only the main frame and wheels from the kit item. Plastic rod and card was used with wire for the lifting handles. I took a little break from all this destruction and construction and painted the beaching gear a dull red colour.

First lick of paint

By this time, the model was looking a little sorry for itself after all the marking, cutting, scribing, sanding etc. I gave it a wash in lukewarm water and let it air dry. Openings were filled with cut pieces of sponge and masking tape and portholes filled with Micro Kristal Klear.

As it would be a primarily white finish, I did not want to use a grey primer. I tend to use Halfords acrylic auto primers but have found in the past that this can go on rather thickly and can obscure detail. I therefore decanted some of the primer into a small jar and after waiting a few hours for the gasses to leech out of the paint, sprayed it



front and rear turrets complete and painted

over the entire model. This worked quite well except that there were some areas where the primer dried with a rough finish. I think it may have been because I was slightly too far from the model when spraying and it was drying before hitting the surface. It was not an easy spray job to apply white primer to a white model.

The rough areas were rubbed out using Micro-mesh to restore a smooth surface. Indeed I went over the whole model with 20000 grit Micro-mesh, using slightly coarser grit in these areas. I find that this gives an excellent surface on which to apply the top coat.

I applied some pre-shading from dark grey on the white areas and black on the top surfaces where it would be covered by Extra Dark Sea Grey.

The top coats were airbrushed Hannant's Xtracrylix. I find it best to use Hannant's own brand of thinner for airbrushing and simply do it by 'eye'. When it is around the consistency of skimmed milk it is okay. It does tend to clog the nozzle of the brush at times when spraying but I keep a handy supply of cotton buds and paper towel so this can be removed as necessary.

Once the white was on and dry, some copious masking was needed before the Extra Dark Sea Grey could be applied. It was now starting to look like a Sunderland.

I then masked the area of the hull bottom which was immersed on landing. This area would have been somewhat discoloured and I sprayed on more white to which had been added some light stone. Just enough to give a different shade. This was then gently rubbed down with Micro-



The fishtail exhaust manifolds

mesh to take 'the edge' off the contrast and to make it a little more uneven.

Turrets

A break from painting was made to do some turret construction. The front and rear turrets of the Sunderland Mk V were of a different shape to those of the earlier Marks. Those supplied in the Falcon Clear Vacs set are for the Mk III and could not be used.

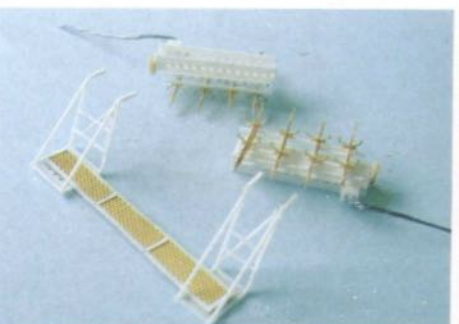
I filled the kit rear turret with Milliput into which a piece of sprue was pushed to use as a handle. When all was solid, I reshaped the turret with wet and dry to better represent the flowing curves of the new one. I then crash-moulded the glazing from clear plastic. It was okay after several attempts and some singed fingers. The kit-supplied turret rear was used.

I tried the same with the front turret but could not get a satisfactory mould due to the subtle undercutting. The turret itself is an FN5 as fitted to the Lancaster and many other bombers, but the cupola glazing has a shape all its own. I searched around the spares boxes and eventually found the clear parts for a mid-upper turret from a Hasegawa Lancaster. By gluing these together, and sanding the sides vertical but leaving the front with the curved bulge, I had a decent Sunderland nose turret. Framing for them all would be added from painted decal strips.

I built the turret interiors from scrap plastic card, rod and wire, all the time making sure that they would fit inside the new glazing. The mid-upper turret was built on the kit mounting which



The mid-upper turret in place



The scratchbuilt inspection platforms under construction





was a tight fit in the hole I had recut in the fuselage top. The vacform glazing from Falcom could be used for this one. The front turret was fitted to a reshaped front fairing. All guns would be replaced with Quickboost resin barrels towards the end of the build.

Markings

The entire model was given two brushed coats of Johnsons Klear/Future to provide a nice gloss surface. I wanted to model a Sunderland Mk V of No.330 (Norwegian) Squadron, as it had a flash of colour with the Norwegian flag either side of the fuselage. This squadron was equipped with Sunderland Mk IIIs but received some Mk Vs before the war's end. One of these was RN267, WH•B.

All markings came from various aftermarket sheets I have in stock. I think most of them were Xtradecals. The codes were more of a problem as I did not have the correct letters in Light Slate Grey. I had the 'W' and some other letters. I managed to cobble up the remaining letters by some judicious cutting. The Norwegian flags came from a Catalina sheet from Vingtor Decals. Serials were from Modeldecal.

Adding some wear and tear

Once all the decals were dry, I applied an oil wash to the top surfaces using Paynes Grey thinned with pure turpentine. This highlighted the panel lines nicely. Some panels were very gently post-shaded with a slightly lighter shade of Extra Dark Sea Grey. I did not add any wash to the panels on the hull sides as they were quite well defined as they were. A wash might have left the hull looking like it was built of brick. The only place where I added any highlight to the lines was around the waterline and hull bottom. I used Van Dyke Brown for this.

I added staining around the waterline using Tamiya pastels applied with a sponge brush. I used both black and the oil stain colour. Paint chips were added with a fine brush using a mix of dark grey and metallic steel. It was looking perhaps a little too shabby at this stage, but hopefully the final matt coat would tone it all down.

The exhausts were metal items from Moskit which I invested in many years ago. They are superb being properly hollow and the correct

colour. I added them to the nacelles and sprayed Tamiya Smoke stains to their rear.

Final details

It was now time to add all the small details which to me bring the model to life. I scratchbuilt some new bomb racks from plastic strip and added the bomb carriers themselves from etched brass items which came from a White Ensign set intended for the Lancaster. This is one area where I think etched brass wins, especially when you have to make eight of them! These were painted aluminium and added to the slots in the lower wing.

The engine servicing platform was also scratchbuilt from rod and plastic card, and when painted, was hung on the wing platforms.

Various aerials were fashioned from stretched sprue, plastic card etc. The floats were added to

the lower wing. I had already drilled some small holes for the rigging wires and the rigging was made from stretch lycra thread. Adding these was one of the hardest parts of the model due to their relative inaccessibility. The beaching gear was finally fixed to the model.

When I felt that all was done, the model was then airbrushed with matt varnish. I use Xtracolour enamel varnish and have never had a problem with it provided it is shaken/stirred very well and suitably thinned. When the matt coat was dry, the turrets were added and gun barrels fixed in place.

I then filled the closed portholes with Humbrol Clearfix. The open portholes were simply punched from a sheet of clear plastic using an office ring binder punch which happened to provide circles of the correct size. Each of these had a slightly smaller disc of masking tape applied so that the framing could be painted. When the framing was dry, the masking was removed and each porthole was carefully fixed in place. The model was finally finished.

Conclusion

Was it worth the effort? To my mind yes. Despite the age of the kit, (almost fifty years old), it is still a very good – the only! – basis for a 1/72 scale Sunderland model. And of course I got months of enjoyment out of it. Now watch MPM/Special Hobby release one! And can you see all that interior detail once it is all closed up and finished? Yes you can – with a small torch, and if you move the model into that position and tilt your head slightly... **MAM**

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DESCRIPTION

SEATS - Pilot and Observer/Gunner

ENGINE - MAJORITY R.R.Falcon 1/II (230/ 253 hp) 12Cyl.Vee
(also used Hispano-Suiza, Siddleley Puma & Wolseley Viper)ARMAMENT - Single or twin Lewis guns on Scarff ring and
Vickers gun fixed in vee of engine (synchronized).

Bomb rack fitted under lower centre section

SERVICE - RFC, Western Front from March 1917, all purposes
Later Mk served post-war in Europe, Middle East, and India

SPAN - 39' - 3" (11,965)

WEIGHT - Empty 1934 Lb

AREA OF WINGS

4 OUTER AT 92.8 SqFt = 371.2 SqFt

TOP & BOTTOM CENTRE PLANE 34.4 SqFt

TAILPLANE AREA :- 22.2 SqFt

ELEVATORS AREA :- 23.2 SqFt

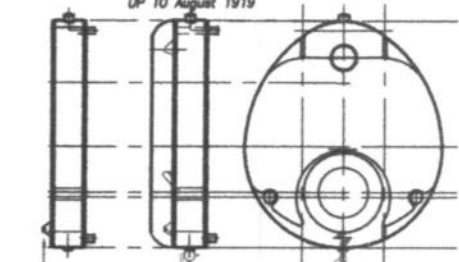
DIHEDRAL (Either side of centre)

Upper Wing - 3 1/8"

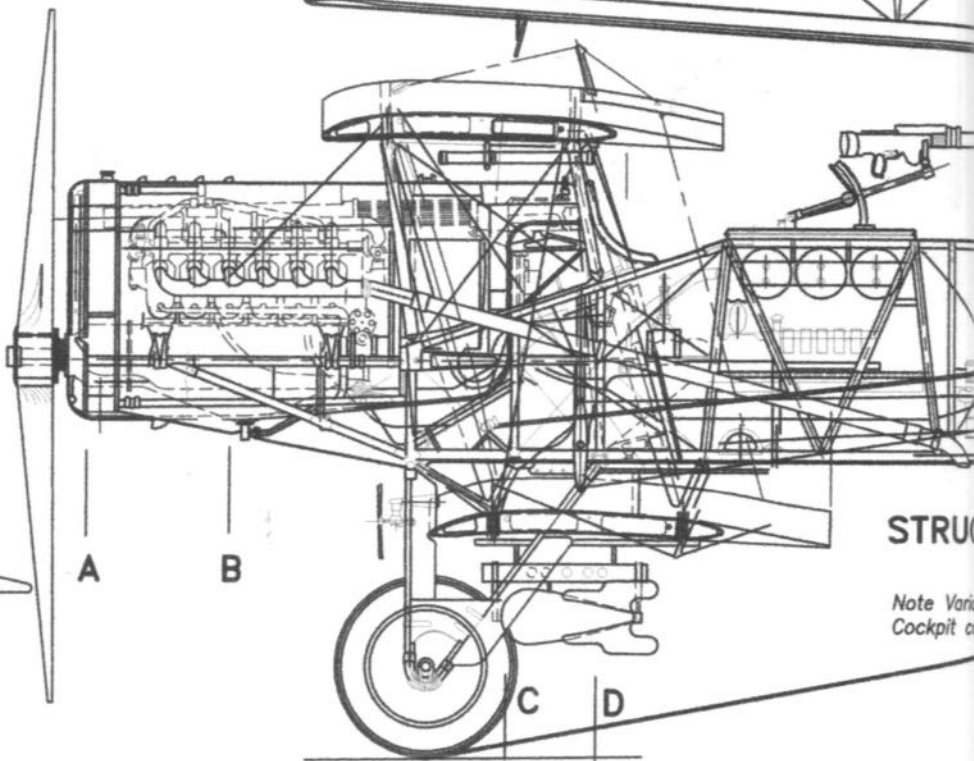
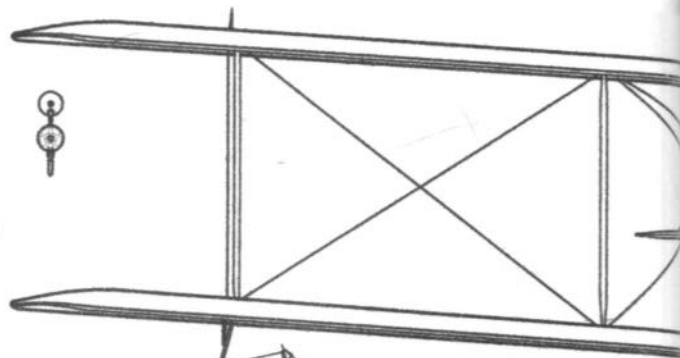
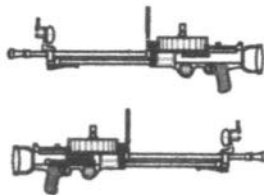
Lower Wing - 4"

TOTAL 405.6 Sq Ft

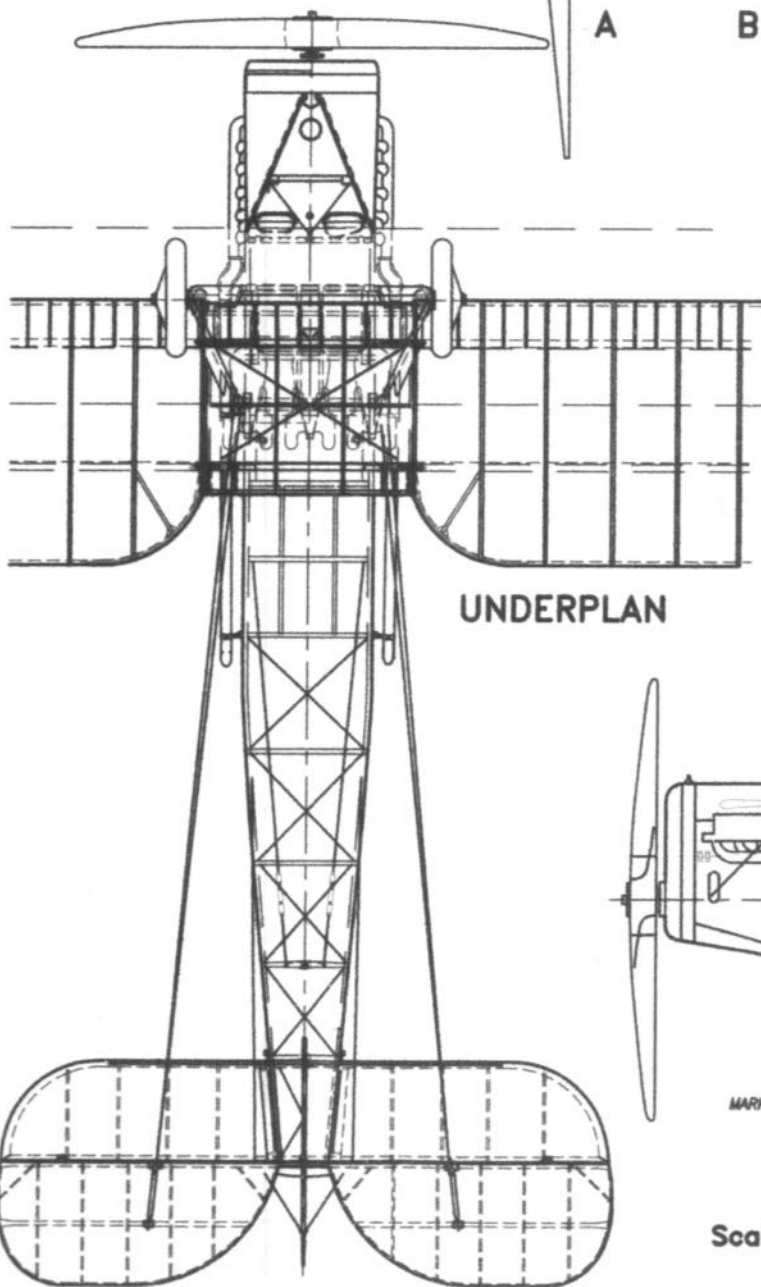
UP TO August 1919

From late 1919
Flat front to Radiator with
shutters mounted externallyRADIATOR
R.R. Falcon

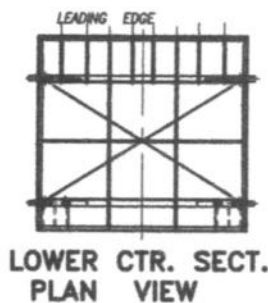
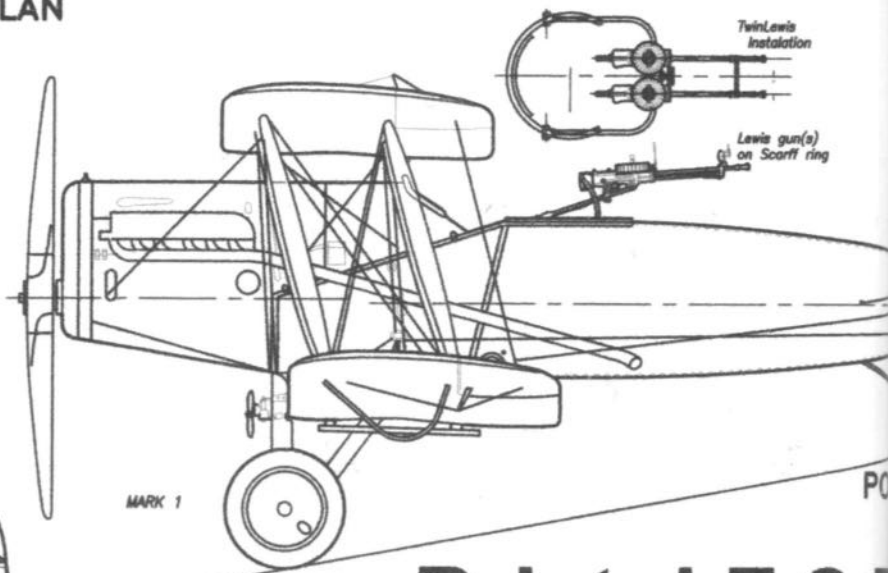
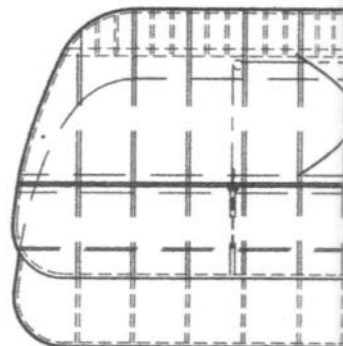
LEWIS GUN



STRUC

Note Vari
Cockpit a

UNDERPLAN

LEADING EDGE
LOWER CTR. SECT.
PLAN VIEW

MARK 1

Bristol F.2B

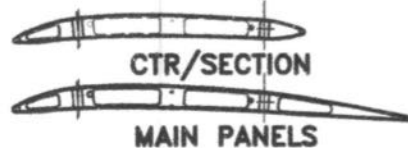
Scale - 1 : 48

feet 0
M

FRONT VIEW

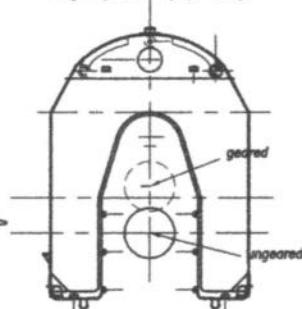
1:48 showing radiator shutters

AEROFOILS

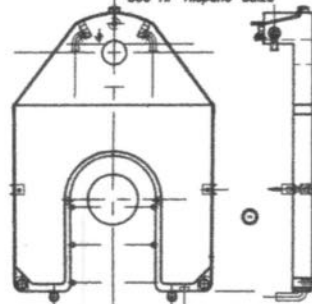


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Radiator of 240HP Sunbeam Arab
Only 2 produced (Sept 1917)

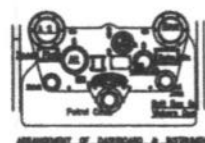


300 HP Hispano-Suiza



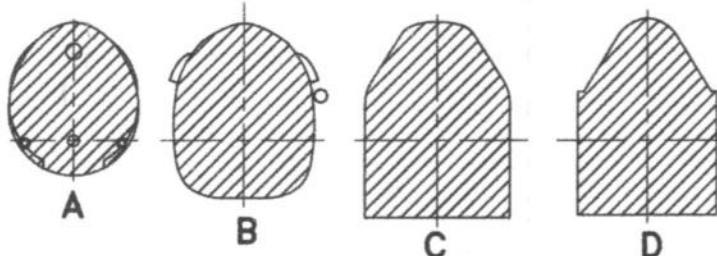
DETAILS

AND STRUCTURAL SIDE VIEW SHOWN AT
1.5 x GENERAL SCALE = 1 : 32



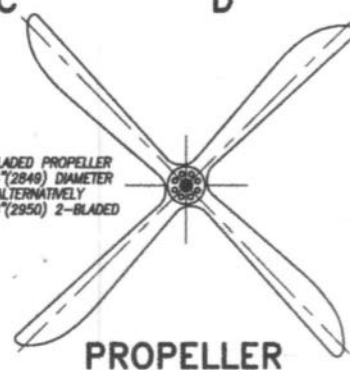
DASHBOARD

PLAN VIEW



The
Bristol
Fighter

4-BLADED PROPELLER
9'-4" (2840) DIAMETER
OR ALTERNATIVELY
9'-8" (2950) 2-BLADED



SIDE VIEW

Mk.I

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Sunderland Mk III, ML822, RB-C of No 10 Sqn RAAF, photographed circa early 1945, with the definitive Extra Dark Sea Grey upper surfaces and White fuselage sides and under surfaces to Pattern No.2, with White wing leading edges, spinners and engine cowlings. Note the code letters and serial number which appear to be Medium Sea Grey but were supposed to be Light Slate Grey (IWM)

AIRFILE

PART
9

Sunderland

Coastal Command Colours for the Sunderland III

Paul Lucas describes the colour schemes and marking applied to the Sunderland Mk IIIs of Coastal Command during World War Two

As with many aircraft types, the story of the camouflage and markings applied to the Sunderland throughout its entire RAF service life is long and tortuous and there is insufficient room here to deal with the subject in its entirety in any detail. Therefore this AIRfile feature will concentrate upon those schemes applied to Coastal Command Sunderland IIIs based in the UK between 1941 and 1945.

As with any RAF aircraft, the documents referred to here only describe what was supposed to happen and do not necessarily reflect what actually did happen, as photographs very often reveal details in the camouflage and markings of these aircraft which differ from the written instructions.

Sunderland finish in 1941

The first prototype Sunderland Mk III was converted from a Mk I, T9042, and was first flown on 28 June 1941. As is generally well known, the principal difference between the Mk I and II and the Mk III was that the Mk III featured a revised 'hull step' design which was more aerodynamically efficient

when the boat was in the air but degraded the boat's handling characteristics on the water.

The first production batch of Sunderland Mk IIIs was built by Short Brothers at Rochester with the first production Sunderland Mk III, W3999, making its maiden flight on 15 December 1941. At the time that the first production Sunderland IIIs were taking shape during the late summer of 1941, the camouflage and markings employed on Flying Boats of RAF Coastal Command were those set out in AMO A.513/41 which was issued on 10 July 1941. This called for all Flying Boats, Float-planes and Amphibians to be camouflaged on the upper surfaces in the Temperate Sea Scheme of Extra Dark Sea Grey and Dark Slate Grey whilst their under surfaces were to be 'duck egg blue' (ie Sky type S).

This camouflage scheme was applied to the Sunderland to what DTD Technical Circular No 144, issued in March 1941, defined as Pattern No 1 with the demarcation line between the upper and under surfaces low down on the fuselage sides.

On the Sunderland this took a peculiar form on

the hull. Forward of the 'step', the Sky under surfaces followed the chine of the hull but from the 'step' aft, the Sky under surface finish proceeded up the side of the hull towards the tail in what might best be described as a gently undulating line which attempted to follow the 60 degree tangent line which defined Pattern No 1 over the somewhat complex shape of the hull.

On the wings and engines, the demarcation line followed the centre line when the aircraft was seen in side elevation, whilst on the floats the under surface colour followed the line of the chine.

The upper surfaces were finished in the disruptive scheme shown in Air Diagram 1163 Camouflage Scheme for Four Engined Monoplanes-General Reconnaissance, (Flying Boats), using Extra Dark Sea Grey and Dark Slate Grey. When the practice of applying the 'A' and 'B' Schemes to alternate aircraft on the production line was dispensed with in early 1941, Shorts appear to have chosen the 'A' Scheme for continuous application to all Sunderlands.

National markings consisted of Red and Blue roundels of 112 inches diameter on the upper surface of the mainplanes, Red, White, Blue and Yellow roundels of 48 inches diameter on the sides of the fuselage and a 24 inch wide by 27 inch high marking on the fin. The serial number was applied in characters 8 inches high just forward of the tailplane. It is not known for certain exactly what colour was used for the application of the fuselage serial number. It was certainly a very light colour which is thought to have been White.

The material specification used for the application of camouflage to Flying Boats was DTD 420A Matt Pigmented Lanolin Resin which had been introduced in April 1941, replacing the original DTD 420 of March 1940. The difference in the two specifications was chemical, the purpose of the finish remaining the same, to protect the air-



The first true Sunderland Mk III, W3999, photographed in spring 1942, and finished in Temperate Sea Scheme upper surfaces of Extra Dark Sea Grey and Dark Slate Grey with Sky under surfaces. It is coded RB-Y of No 10 Sqn RAAF, with which it served until being shot down by an Arado Ar 196 on 21 June 1942 over the Bay of Biscay (IWM)

frame from the highly corrosive effects of sea water. Nearly all the colours referred to above were standard stores items in the RAF Vocabulary of Stores under the reference numbers 33B/370 for Extra Dark Sea Grey; 33B/369 for Dark Slate Grey; 33B/372 for Sky, all of which were for 5 gallon containers, and 33B/460 for Night; 33B/461 for Blue; 33B/462 for Red; 33B/463 for White and 33B/464 for Yellow, all of which were for 1 gallon containers.

The squadron and individual aircraft identification code letters were applied by the squadrons themselves following delivery, and could vary in size and style from one aircraft to another within the same squadron let alone from one squadron to another. AMO A.513/41 stated that such markings were to be applied using 'grey paint' in characters 48 inches high made up of strokes 6 inches wide. Smaller letters were only to be used when the space available on the side of the fuselage made such a course unavoidable. As there was ample space on the fuselage for such markings, the code letters on Sunderlands tended to be about this size although they could be either slightly bigger or smaller from one aircraft to another at various times.

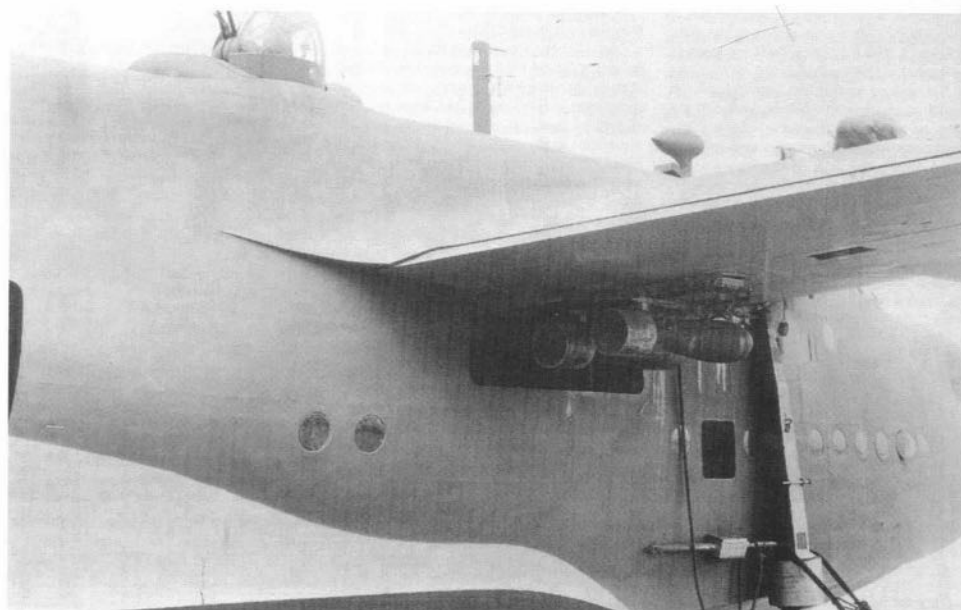
Whilst AMO A.513.41 was not specific as to the shade of 'grey paint' to be used for these markings, it would appear that the Sunderland squadrons followed the established RAF practice of using Medium Sea Grey.

National markings revised

The first change in the camouflage and markings of the Sunderland Mk III came at the end of April and beginning of May 1942 when changes were made to the national markings applied to the sides of the fuselage and fin.

These changes had come about mainly as a result of Bomber Command's experiences of having aircraft coned in searchlights over Germany. When this happened, the 1-3-5-7 proportioned Red, White, Blue and Yellow fuselage roundels were said to show up 'like light bulbs' and thus make the aircraft easily visible. At the time this was thought to be because of the large proportion of white and yellow in the roundels, and many squadrons made unauthorised modifications to their roundels in an attempt to combat this. There was also some concern that the roundels were perhaps just a little too prominent in daylight as well, and therefore the problem was given an airing at a conference to discuss aircraft camouflage which was held at the RAE on 1 September 1941.

As a result of the discussion of the problem, it



Close-up view of the Temperate Sea Scheme/Sky scheme's softly undulating demarcation to Pattern No.1 along the rear fuselage, on an unidentified Sunderland (Short Bros)

was decided to review the whole subject of the roundels and fin markings with the aim of devising markings which whilst remaining distinctive enough for identification purposes, were not more conspicuous than the aircraft which carried them. In meeting this aim, no change was to be made in the colours used, or the general form of the markings.

A further meeting was held on 24 October 1941 to discuss the progress made so far, at which the suggestion was put forward that the best way of reducing visibility by day would be to reduce the size of the white and yellow rings. The deci-

medium aircraft, and 54 inches diameter for large aircraft, such as the Sunderland. This new roundel was designated National marking III.

Modifications to the fin flash were also considered, with modifications to the then standard 24 inch wide and 27 inch high flash being carried out. This resulted in a new flash being adopted in which a 2 inch wide band of White separated 11 inch wide bands of Red and Blue. This was found to have a visibility about equal to that of the new roundel.

As in the case of the roundel, it was recommended that the new fin flash be restricted to three sizes for small, medium and large aircraft.

"New national markings were adopted by the RAF including Coastal Command from 30 April 1942..."

sion was therefore taken to produce a specific proposal for the narrowing of the white and yellow rings in the roundel and of the white band in the fin flash.

Ultimately, following some experimentation, a new roundel was devised which was only about half as visible in daylight as the 1-3-5-7 proportioned roundel then in use. The new roundel had ring widths in the proportions of Red 6, White 1, Blue 4, and Yellow 1. It was recommended that the new roundel be restricted to three sizes, 18 inches diameter for small aircraft, 36 inches diameter for

The width of the White band was to remain at 2 inches for all three sizes, with the flash being 18 inches wide for small aircraft, 24 inches wide for medium size aircraft, and 36 inches wide for large aircraft. Each of these markings was to be 24 inches high and this form of fin flash was designated Fin marking (i).

The Red and Blue roundels which were now designated National marking I on the top of the mainplanes were not affected and remained 112 inches in diameter.

The new national markings were adopted by most of the RAF including Coastal Command from 30 April 1942 when the Air Ministry wrote to all Operational Commands to inform them of the introduction of new type roundels and changes in the colour of the squadron and aircraft code letters.

Squadron code colours revised

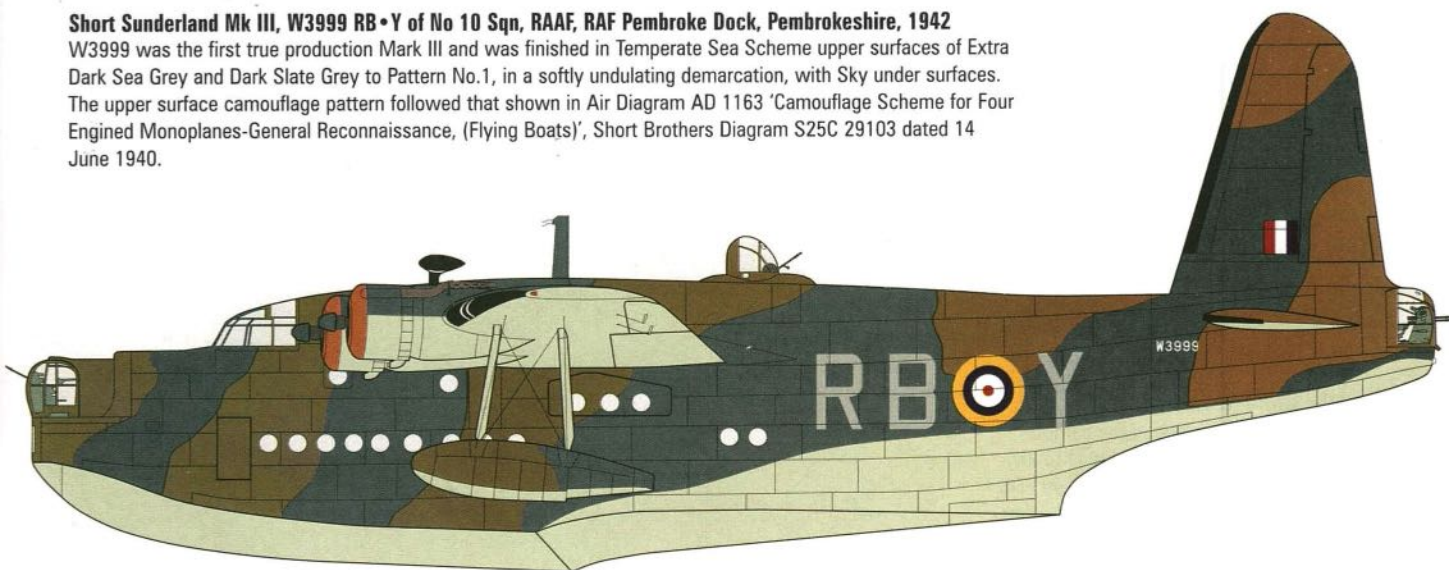
This same letter which introduced the new national markings also heralded a change in the colour of the code letters carried by Sunderlands. Up to this point, as mentioned above, the code letters applied to Temperate Sea Scheme finished aircraft were to be Medium Sea Grey. The letter of 20 April however introduced a change whereby with the exception of Day Fighters and Fighter Command OTU aircraft, excluding Night Fighters which were to have Sky codes and Coastal Command aircraft with White sides and under sur-



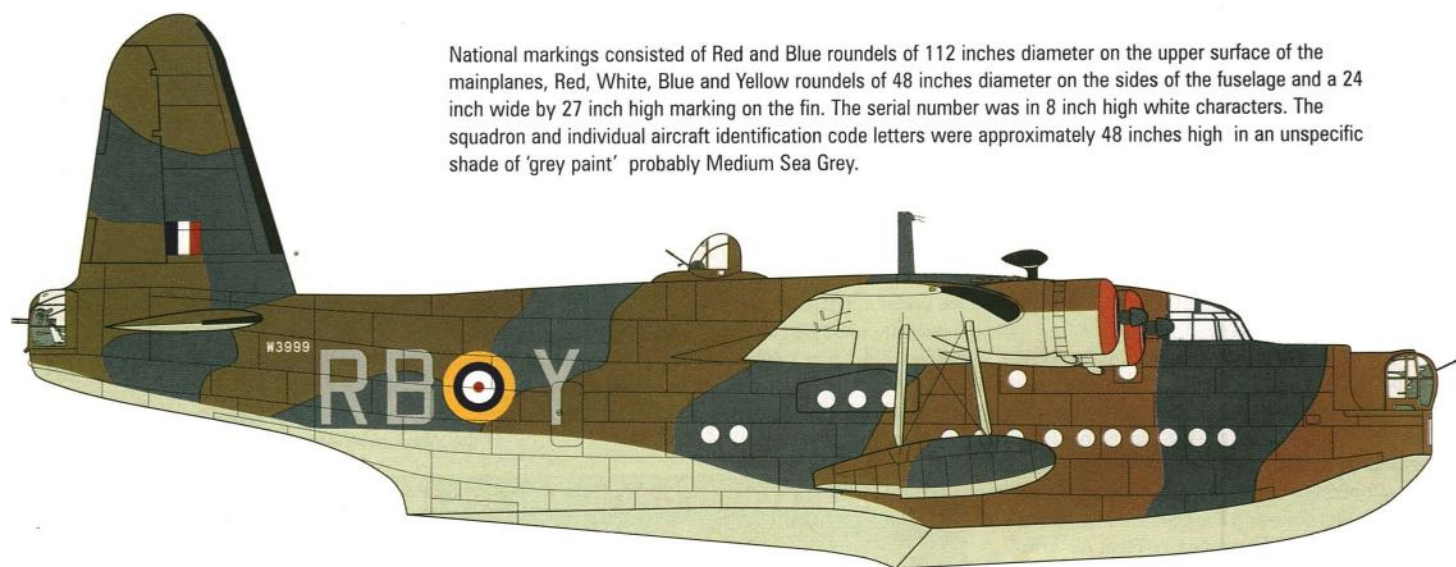
Sunderland Mk III W4004 'Z' of No 10 Sqn RAAF in the Temperate Sea Scheme upper surfaces with White under surfaces to Pattern No.2. Note the revised national markings on the fuselage sides and fin, and the weathering along the fuselage sides and fin (IWM)

Short Sunderland Mk III, W3999 RB•Y of No 10 Sqn, RAAF, RAF Pembroke Dock, Pembrokeshire, 1942

W3999 was the first true production Mark III and was finished in Temperate Sea Scheme upper surfaces of Extra Dark Sea Grey and Dark Slate Grey to Pattern No.1, in a softly undulating demarcation, with Sky under surfaces. The upper surface camouflage pattern followed that shown in Air Diagram AD 1163 'Camouflage Scheme for Four Engined Monoplanes-General Reconnaissance, (Flying Boats)', Short Brothers Diagram S25C 29103 dated 14 June 1940.



National markings consisted of Red and Blue roundels of 112 inches diameter on the upper surface of the mainplanes, Red, White, Blue and Yellow roundels of 48 inches diameter on the sides of the fuselage and a 24 inch wide by 27 inch high marking on the fin. The serial number was in 8 inch high white characters. The squadron and individual aircraft identification code letters were approximately 48 inches high in an unspecific shade of 'grey paint' probably Medium Sea Grey.



faces which were to have Light Slate Grey codes, all other operational and OTU aircraft were to have Red codes.

As the white Coastal Command scheme had not yet been adopted for Flying Boats such as the Sunderland, this meant that from April 1942 Sunderlands could be seen camouflaged on the upper surfaces in the Temperate Sea Scheme with Sky under surfaces to Pattern No 1, National marking I on the upper surface of the wings, National marking III on both sides of the fuselage, Fin marking (i) on the fin and Red code letters which remained the same sort of size as their Medium Sea Grey predecessors.

The origin of the White scheme

The big change which took place in the camouflage of the Sunderland began during 1941 following the enlistment of Professor P M S Blackett FRS as Scientific Advisor to Coastal Command. In starting the process of forming an Operational Research Unit, the camouflage of Coastal Command's aircraft was one of the subjects which was examined.

On 27 May 1941 Blackett contacted the RAE with a number of questions relating to the camouflage of Coastal Command aircraft which were employing the Temperate Land Scheme of Dark Green and Dark Earth on aircraft which operated almost exclusively over the sea and the colouring of the side and under surfaces with the ultimate aim of making the aircraft more difficult to spot from submarines. By the end of May the RAE had prepared a note on the subject which was sent to Professor Blackett.

The note set out the existing camouflage practice pointing out that the scheme then in use had come about as a result of an Air Ministry decision rather than as a result of the pre-war camouflage experiments carried out by the RAE which had led to the adoption of the Temperate Sea Scheme of Extra Dark Sea Grey and Dark Slate Grey with Sky Grey sides and under surfaces for Fleet Air Arm aircraft. The RAE pointed out that when viewed from a submarine, the surfaces of the aircraft most likely to be seen were the sides of the fuselage, fin and rudder which were at that time finished in a dark camouflage colour. Where aircraft did have a light camouflage colour on the under surfaces, this would usually be invisible to an observer and was therefore nearly useless by itself in avoiding detection by a submarine.

The RAE note then went on to recommend



Sunderland Mk III coded 'Z' (serial unknown but not to be confused with W4004 of No 10 Sqn RAAF, as the individual aircraft letter is in front of the fuselage roundel and appears to be Red), in the Temperate Sea Scheme upper surfaces with White under surfaces to Pattern No.2. Note how the upper surface camouflage demarcation runs from the trailing edge of the mainplane to the leading edge of the tailplane. The 112 inch diameter upperwing Red/Blue roundels are well illustrated in this shot (IWM)

that the upper surfaces of Coastal Command aircraft be redefined as in the 1939 Air Diagrams for Fleet Air Arm aircraft with the light under surface colour covering the vertical sides of the fuselage, fin and rudder. The colour the RAE suggested for the under surfaces was Sky Blue which with a reflectivity of 58 percent was lighter than Sky at 44 percent but not as bright as White at 73 percent which was felt to be too bright in relation to the sky at what the RAE considered to be average skies at common altitudes of flight.

tions'. The copy of this report seen by the author was undated but probably had its origins in late July 1941.

According to the report, the purpose of a specialist anti-submarine camouflage was to reduce the distance at which aircraft could be seen from the submarine in order to give the aircraft a better chance of making a successful attack before the submarine could escape by diving.

Analysis of weather statistics had shown that in the Western Approaches, where the majority of

"Experiments by the RAE led to the adoption of the Temperate Sea Scheme..."

By 3 July the proposed change in camouflage for Coastal Command had reached the Ministry of Aircraft Production who noted the proposals but were of the opinion that full scale tests should be carried out before any changes were implemented. Trials were subsequently carried out by Coastal Command and the findings published in Report ORS C/144 entitled 'Note on the Camouflage of Aircraft engaged on Antisubmarine Opera-

anti-submarine sorties took place, there was seven-tenths cloud or more during three quarters of every month and that the average height of the cloud base was 2,000 feet. Since the aircraft usually operated below this altitude, the most frequent background against which an aircraft would be seen was an overcast cloudy sky without direct sunlight. Therefore all those parts of the aircraft which could be seen from the viewpoint of the submarine should be white in colour.

Whilst the application of white paint would prove to be fairly effective on the vertical surfaces, the under surfaces, being in shadow, would always appear darker than the sky in the background. However, if a gloss white finish was applied to the under surfaces instead of a matt white finish, the gloss finish would reflect more of the available light which was reflected from the surface of the sea towards the observer, thus going some way to offsetting the shadow and helping make the aircraft less visible.

A plain white finish without any disruptive pattern was chosen because whilst such a disruptive pattern might break up the outline of the aircraft when viewed against a background of equal brightness to the aircraft, the aircraft would always be seen against a lighter background and the use of a colour darker than white would only make the aircraft more noticeable.

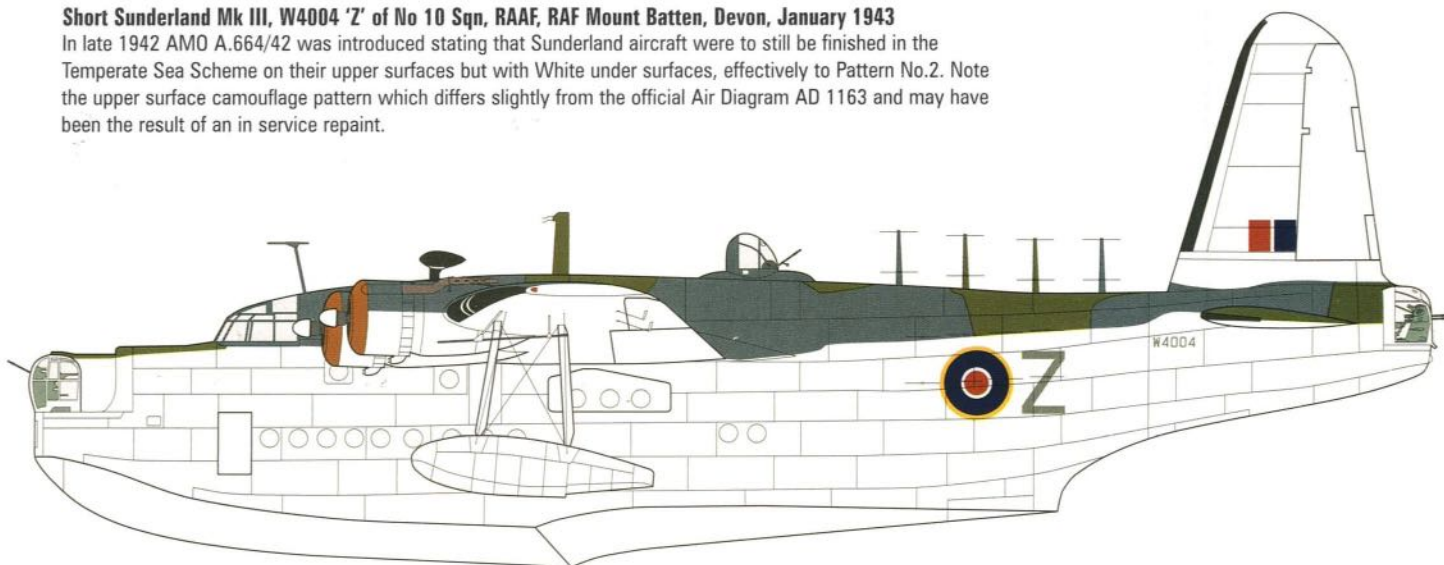
The report concluded that all surfaces which



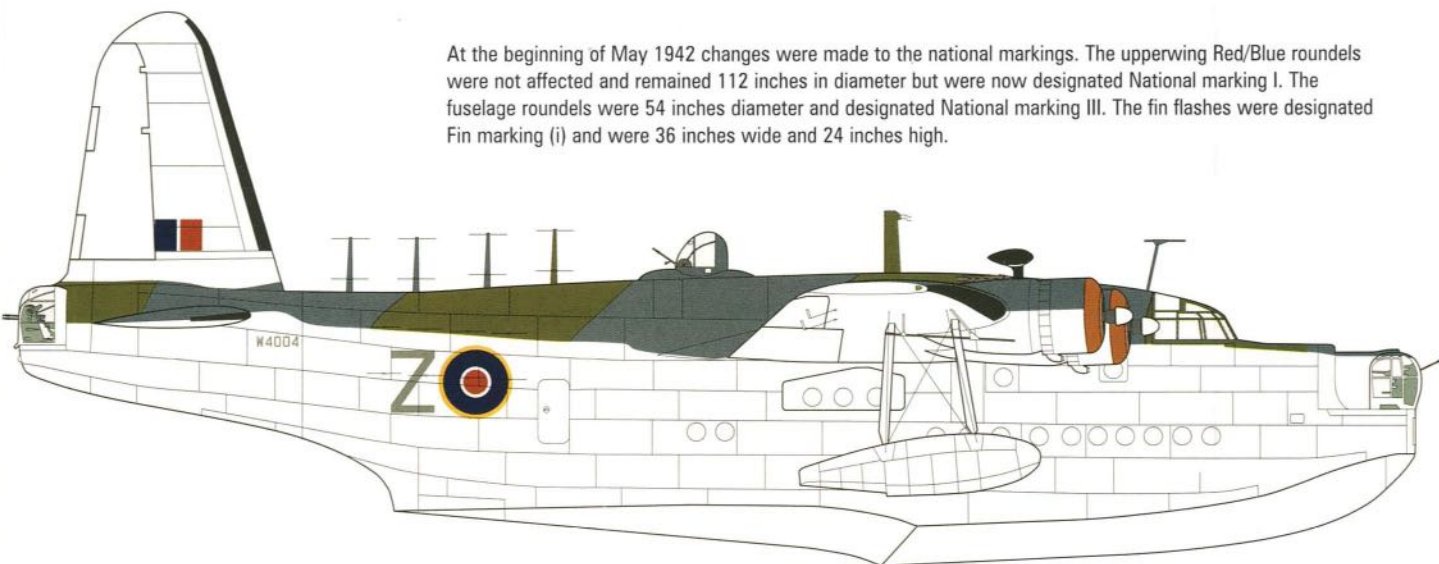
Sunderland Mk III DV960 'H' of No 461 Sqn RAAF in a very weathered Temperate Sea Scheme with White under surfaces scheme. Try reproducing this in 1/72 scale... (D Roberts)

Short Sunderland Mk III, W4004 'Z' of No 10 Sqn, RAAF, RAF Mount Batten, Devon, January 1943

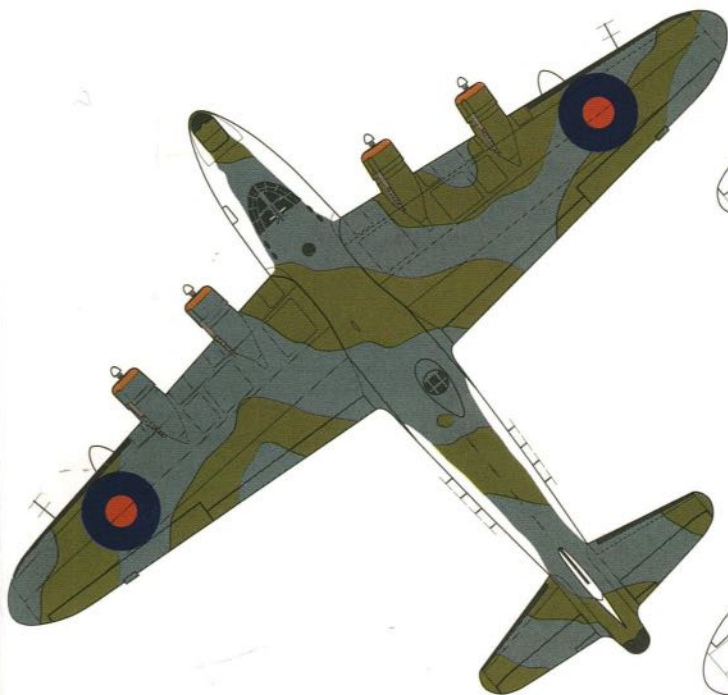
In late 1942 AMO A.664/42 was introduced stating that Sunderland aircraft were to still be finished in the Temperate Sea Scheme on their upper surfaces but with White under surfaces, effectively to Pattern No.2. Note the upper surface camouflage pattern which differs slightly from the official Air Diagram AD 1163 and may have been the result of an in service repaint.



At the beginning of May 1942 changes were made to the national markings. The upperwing Red/Blue roundels were not affected and remained 112 inches in diameter but were now designated National marking I. The fuselage roundels were 54 inches diameter and designated National marking III. The fin flashes were designated Fin marking (i) and were 36 inches wide and 24 inches high.

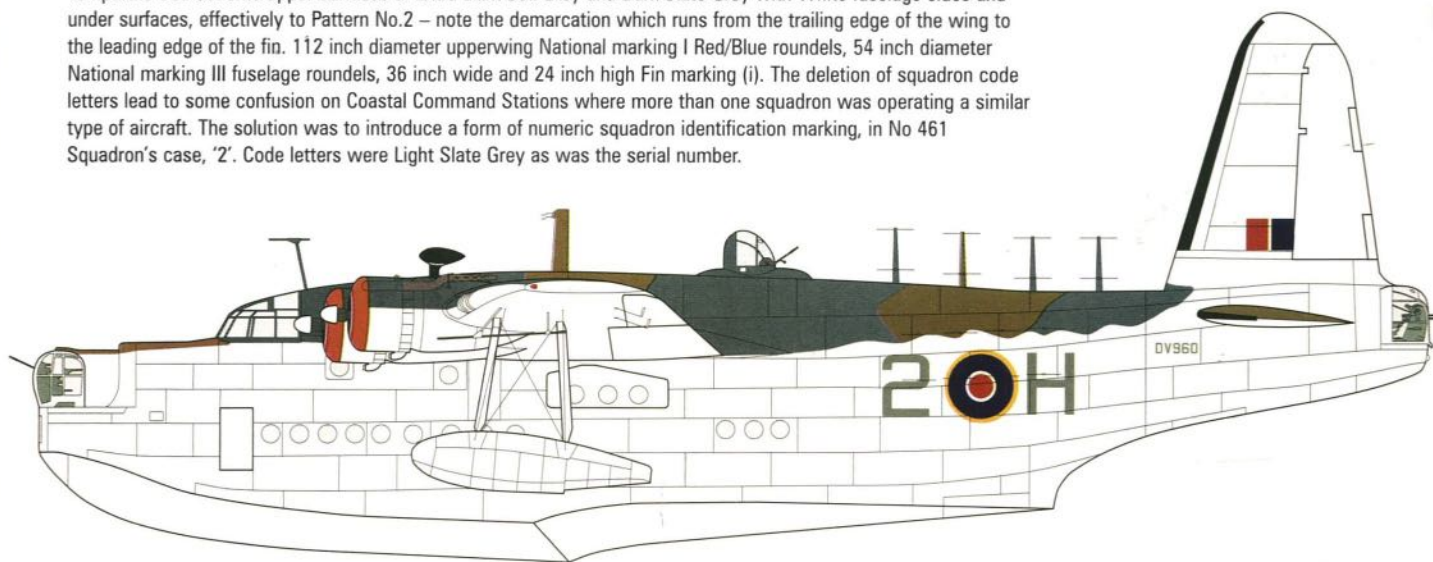


At the same time letter the code letters carried by Sunderlands were changed to Light Slate Grey and the two letter squadron codes were dispensed with, just leaving the individual aircraft identification letter.

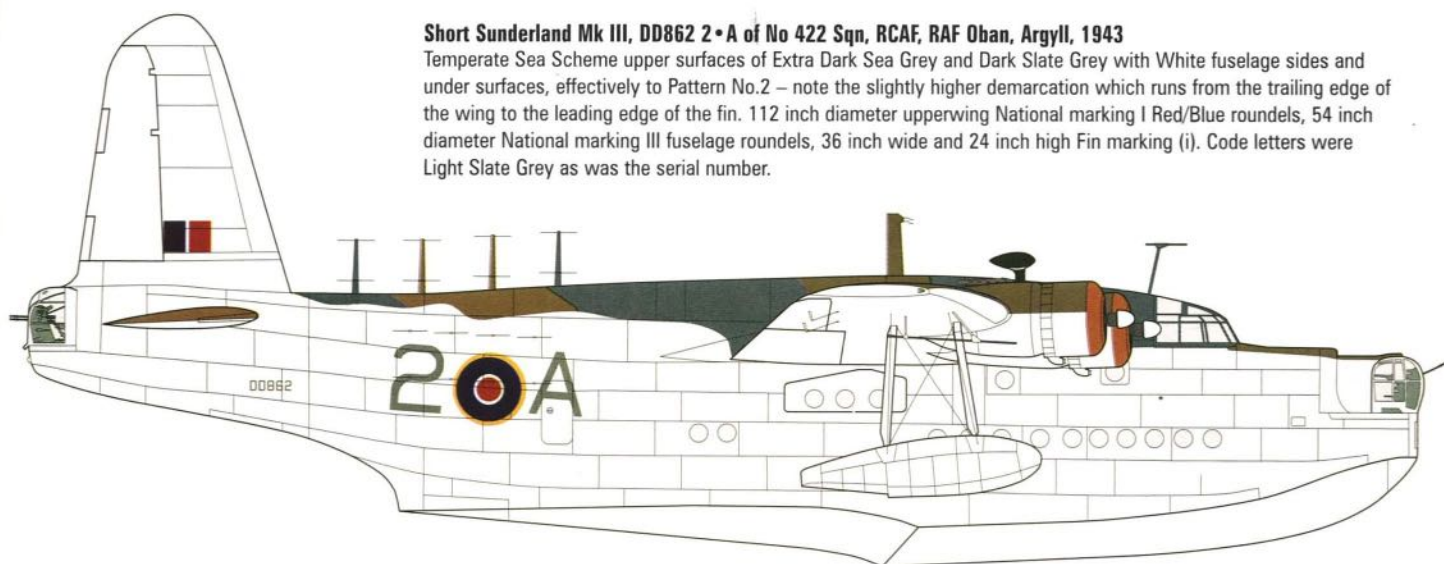


Short Sunderland Mk III, DV960 2•H of No 461 Sqn, RAAF, RAF Pembroke Dock, Pembrokeshire, summer 1943

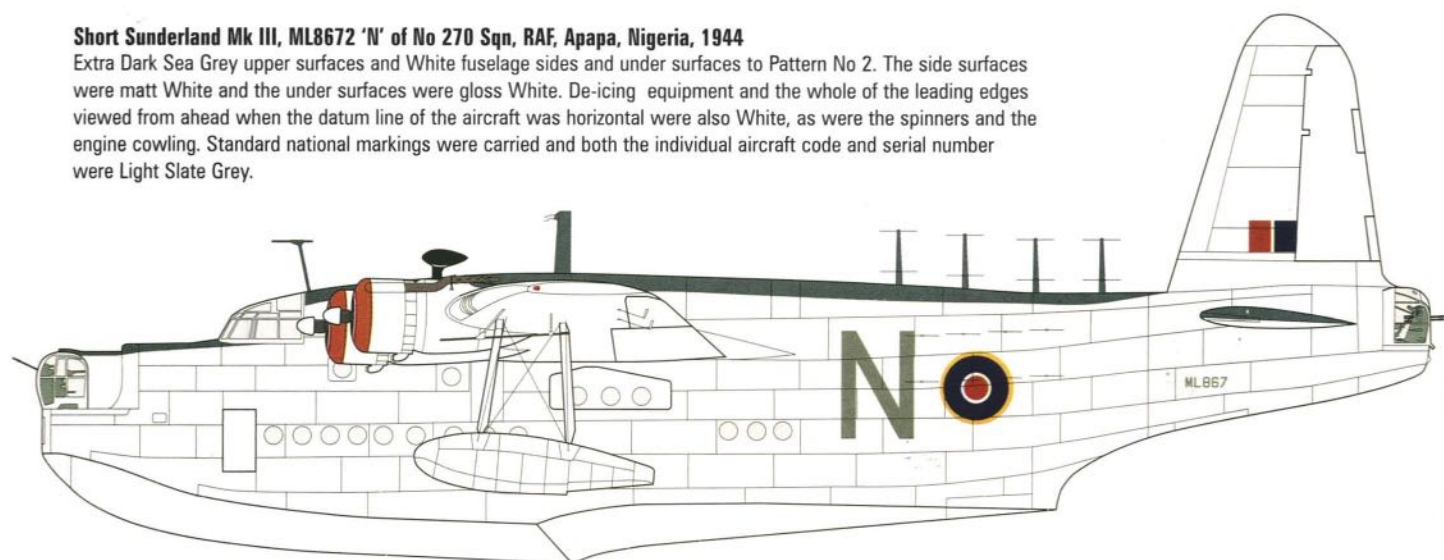
Temperate Sea Scheme upper surfaces of Extra Dark Sea Grey and Dark Slate Grey with White fuselage sides and under surfaces, effectively to Pattern No.2 – note the demarcation which runs from the trailing edge of the wing to the leading edge of the fin. 112 inch diameter upperwing National marking I Red/Blue roundels, 54 inch diameter National marking III fuselage roundels, 36 inch wide and 24 inch high Fin marking (i). The deletion of squadron code letters lead to some confusion on Coastal Command Stations where more than one squadron was operating a similar type of aircraft. The solution was to introduce a form of numeric squadron identification marking, in No 461 Squadron's case, '2'. Code letters were Light Slate Grey as was the serial number.


Short Sunderland Mk III, DD862 2•A of No 422 Sqn, RCAF, RAF Oban, Argyll, 1943

Temperate Sea Scheme upper surfaces of Extra Dark Sea Grey and Dark Slate Grey with White fuselage sides and under surfaces, effectively to Pattern No.2 – note the slightly higher demarcation which runs from the trailing edge of the wing to the leading edge of the fin. 112 inch diameter upperwing National marking I Red/Blue roundels, 54 inch diameter National marking III fuselage roundels, 36 inch wide and 24 inch high Fin marking (i). Code letters were Light Slate Grey as was the serial number.


Short Sunderland Mk III, ML8672 'N' of No 270 Sqn, RAF, Apapa, Nigeria, 1944

Extra Dark Sea Grey upper surfaces and White fuselage sides and under surfaces to Pattern No 2. The side surfaces were matt White and the under surfaces were gloss White. De-icing equipment and the whole of the leading edges viewed from ahead when the datum line of the aircraft was horizontal were also White, as were the spinners and the engine cowlings. Standard national markings were carried and both the individual aircraft code and serial number were Light Slate Grey.



MDF15 – F-14 Tomcat

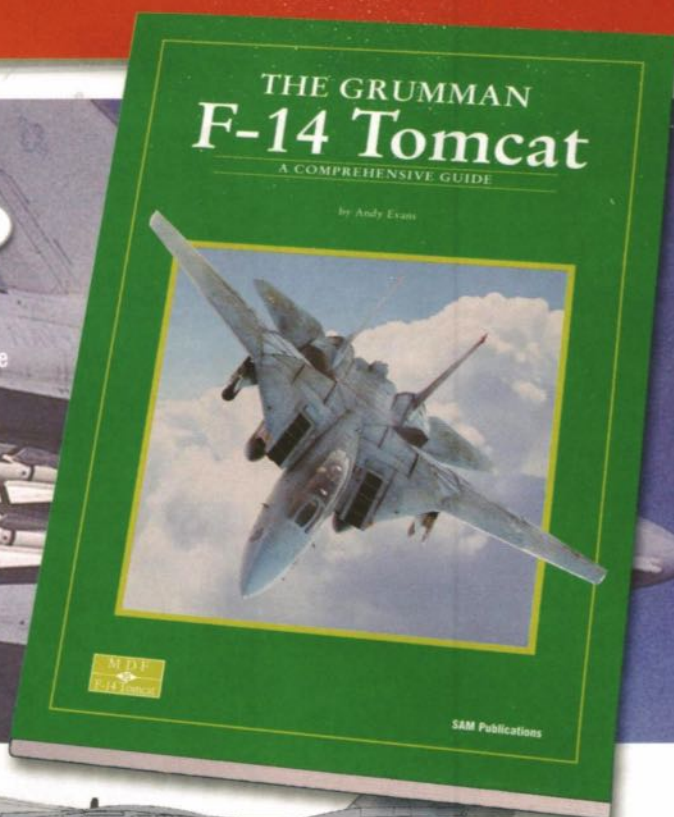
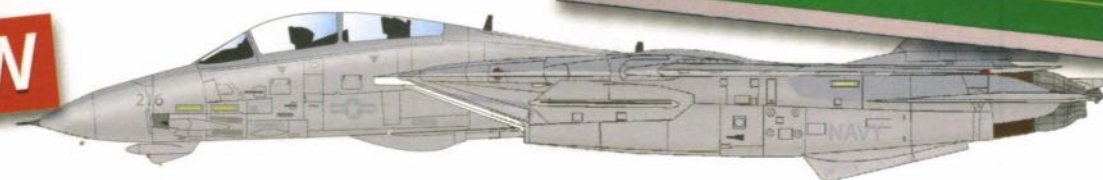
The Grumman F-14 Tomcat

written by Andy Evans

- 128 Pages – full colour throughout
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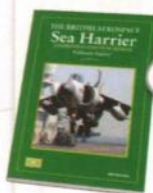


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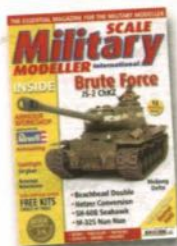
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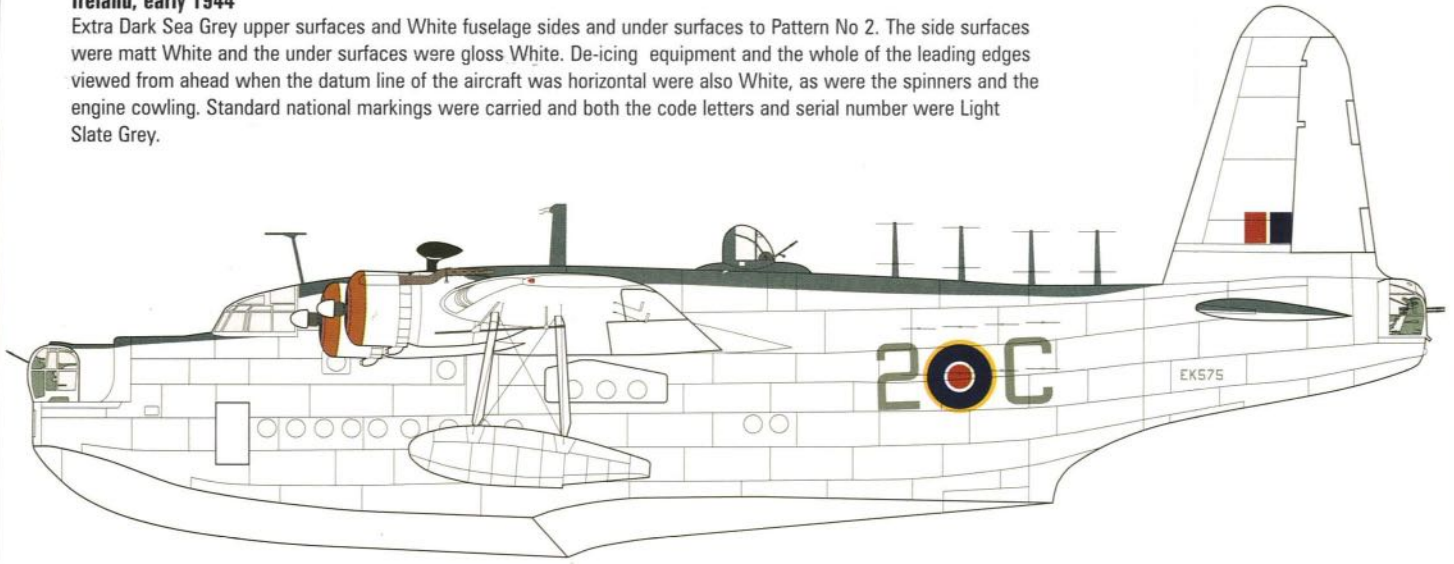
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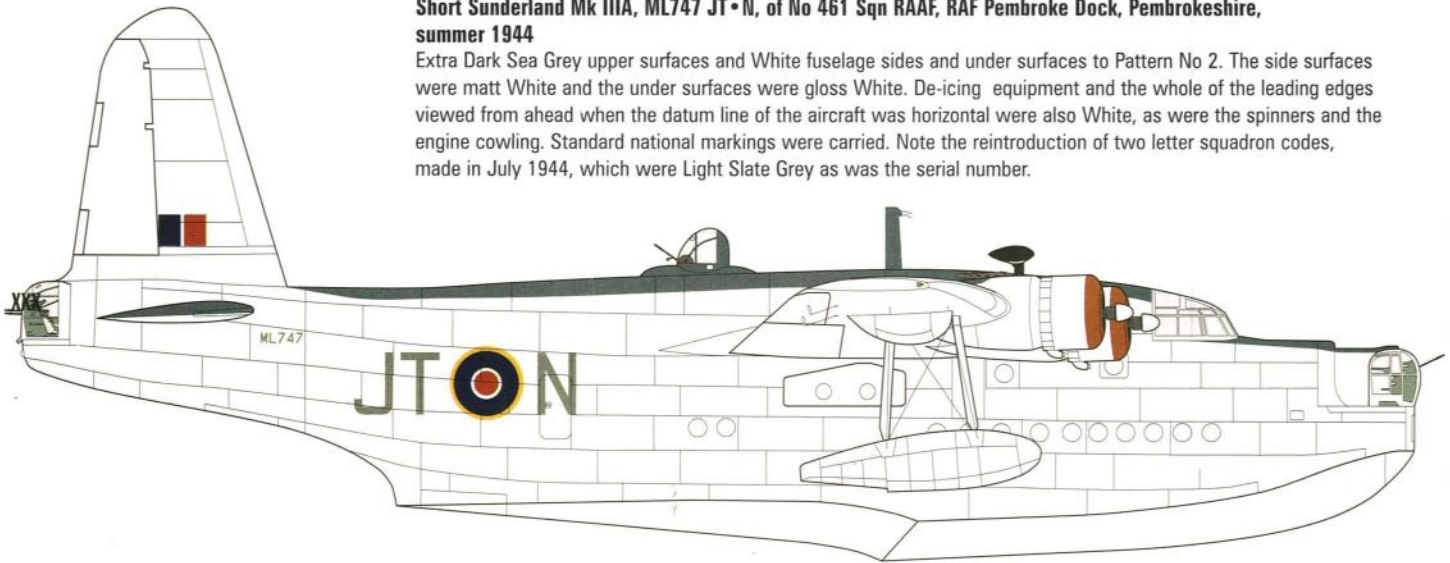
Short Sunderland Mk III, EK575 2 • C, of No 422 Sqn RCAF, RAF Castle Archdale, County Fermanagh, Northern Ireland, early 1944

Extra Dark Sea Grey upper surfaces and White fuselage sides and under surfaces to Pattern No 2. The side surfaces were matt White and the under surfaces were gloss White. De-icing equipment and the whole of the leading edges viewed from ahead when the datum line of the aircraft was horizontal were also White, as were the spinners and the engine cowlings. Standard national markings were carried and both the code letters and serial number were Light Slate Grey.



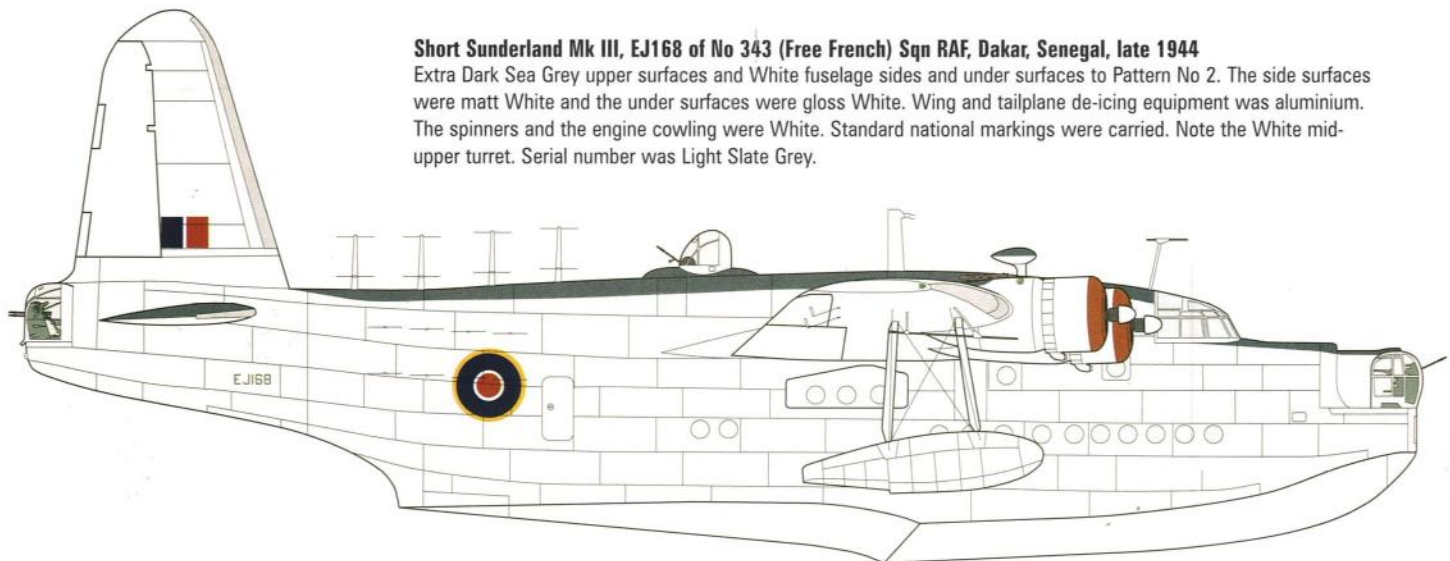
Short Sunderland Mk IIIA, ML747 JT • N, of No 461 Sqn RAAF, RAF Pembroke Dock, Pembrokeshire, summer 1944

Extra Dark Sea Grey upper surfaces and White fuselage sides and under surfaces to Pattern No 2. The side surfaces were matt White and the under surfaces were gloss White. De-icing equipment and the whole of the leading edges viewed from ahead when the datum line of the aircraft was horizontal were also White, as were the spinners and the engine cowlings. Standard national markings were carried. Note the reintroduction of two letter squadron codes, made in July 1944, which were Light Slate Grey as was the serial number.



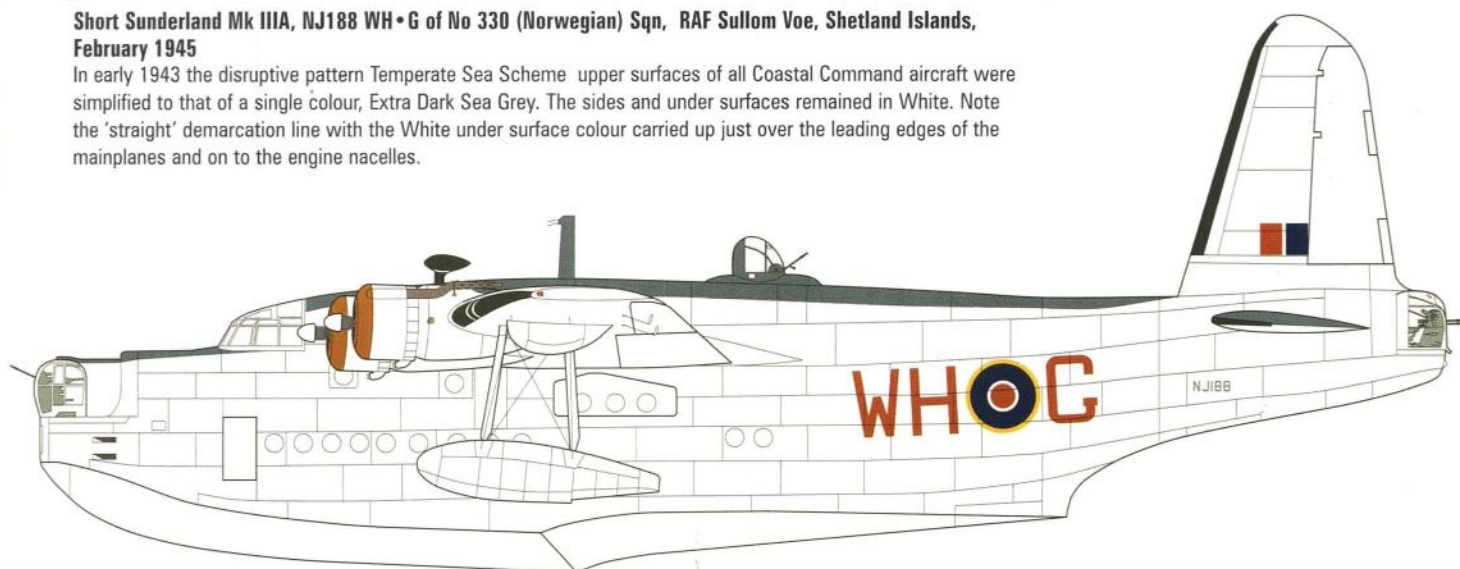
Short Sunderland Mk III, EJ168 of No 343 (Free French) Sqn RAF, Dakar, Senegal, late 1944

Extra Dark Sea Grey upper surfaces and White fuselage sides and under surfaces to Pattern No 2. The side surfaces were matt White and the under surfaces were gloss White. Wing and tailplane de-icing equipment was aluminium. The spinners and the engine cowlings were White. Standard national markings were carried. Note the White mid-upper turret. Serial number was Light Slate Grey.

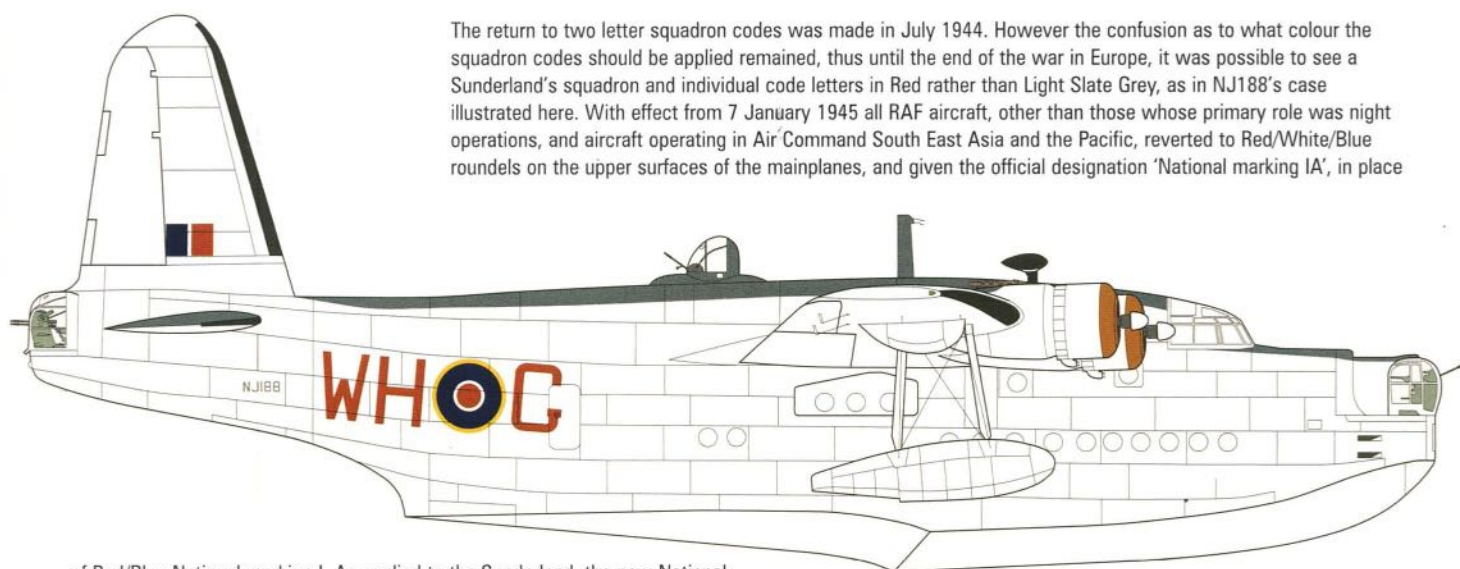


Short Sunderland Mk IIIA, NJ188 WH•G of No 330 (Norwegian) Sqn, RAF Sullom Voe, Shetland Islands, February 1945

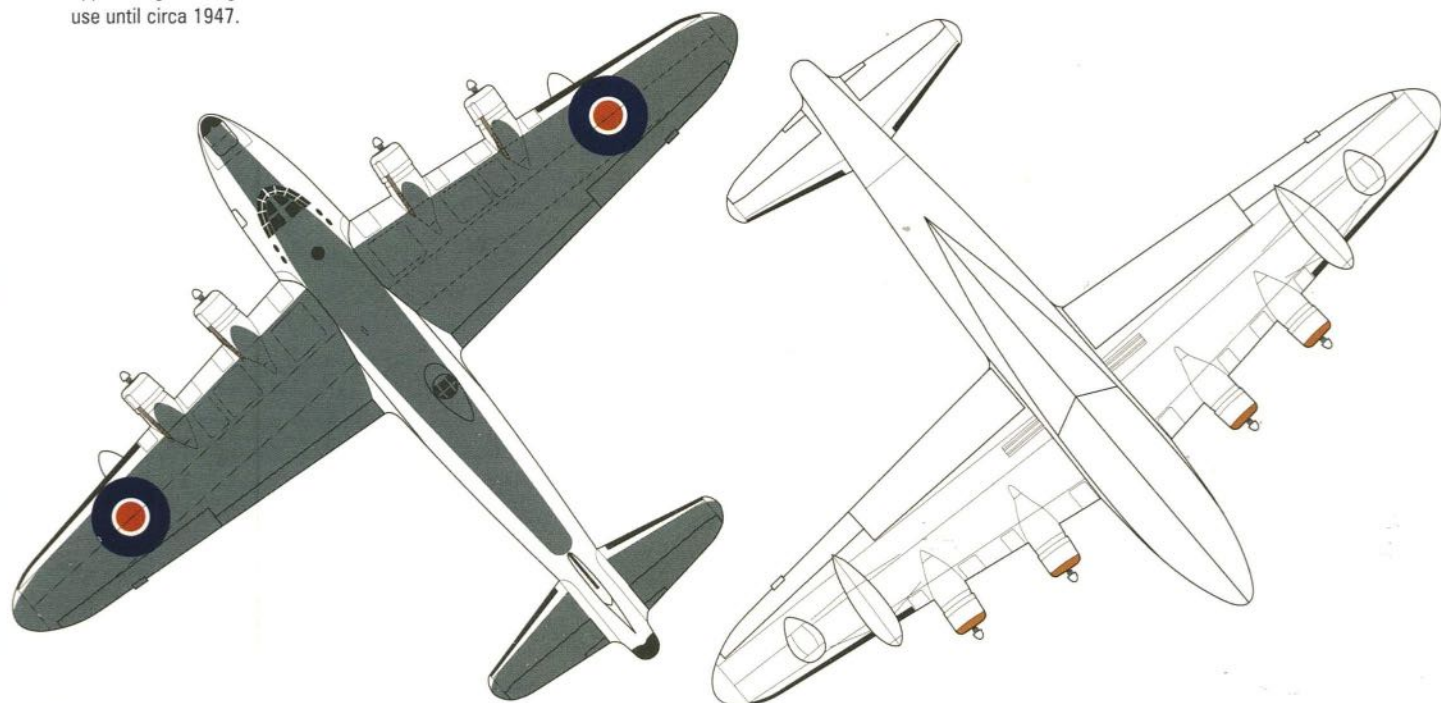
In early 1943 the disruptive pattern Temperate Sea Scheme upper surfaces of all Coastal Command aircraft were simplified to that of a single colour, Extra Dark Sea Grey. The sides and under surfaces remained in White. Note the 'straight' demarcation line with the White under surface colour carried up just over the leading edges of the mainplanes and on to the engine nacelles.



The return to two letter squadron codes was made in July 1944. However the confusion as to what colour the squadron codes should be applied remained, thus until the end of the war in Europe, it was possible to see a Sunderland's squadron and individual code letters in Red rather than Light Slate Grey, as in NJ188's case illustrated here. With effect from 7 January 1945 all RAF aircraft, other than those whose primary role was night operations, and aircraft operating in Air Command South East Asia and the Pacific, reverted to Red/White/Blue roundels on the upper surfaces of the mainplanes, and given the official designation 'National marking IA', in place



of Red/Blue National marking I. As applied to the Sunderland, the new National marking IA remained the same size as the earlier Red and Blue National Marking I with an overall diameter of 112 inches. This new marking became the standard upper wing marking for the rest of the war and remained in use until circa 1947.



could be seen from vertically beneath the aircraft should be glossy white. All other surfaces which could be seen from the viewpoint of a submarine, (roughly defined as those surfaces which can be seen from an angle of eight degrees or more below the horizontal), should be matt white. The upper surfaces, that is to say all surfaces which can be seen from vertically above the aircraft, (other than the side surfaces), should be finished in the Temperate Sea Scheme.

A change in camouflage policy

Partly as a result of this report, Coastal Command's camouflage policy was changed with the changes being promulgated by HQ Coastal Command to many interested parties by Postagram on 8 August 1941, a memo to all its operational Groups on 10 August 1941 and by a further Postagram to the Ministry of Aircraft Production, HQ Maintenance Command and Nos 40 and 41 Groups on 26 August 1941.

It was stated that the upper surfaces of all Coastal Command aircraft were henceforward to be camouflaged in the Temperate Sea Scheme but that the under surfaces would vary according to the role of the aircraft and should be met as follows:

Wellington, Whitley and Liberator aircraft were to have their under surfaces as defined by No 1 Pattern finished in glossy White. The remaining side surfaces as defined by No 2 Pattern and the side surfaces of the fins and rudders were to be finished in matt White. De-icing equipment fitted to all leading edges was to be painted with a special flexible White paint which was to be obtained from the RAE at Farnborough whilst the engine cowlings were to be finished with White stoving enamel

"The upper surfaces were Extra Dark Sea Grey, the sides matt White and the undersides glossy White..."

Beauforts, Beaufighters, Blenheims and Hudsons were to be camouflaged on their upper surfaces in the Temperate Sea Scheme whilst the under surfaces were to be Sky to No 1 Pattern. National markings were to remain standard throughout.

Flying Boats such as the Sunderland are conspicuous by their absence from this letter and this might explain why the early production Sunderland Mk IIIs appeared finished in the Temperate Sea Scheme and Sky camouflage to Pattern No 1 when they first began to be delivered in December 1941.



Sunderland Mk III DD852 'J' of No 10 Sqn RAAF in what appears to be the two-colour Temperate Sea Scheme upper surfaces although it may be a single colour Extra Dark Sea Grey as the engine cowlings are overall White. Again the weathering and exhaust staining is very evident (K Ginnane)

AMO A.664/42 and White Sunderlands

Unfortunately it is not currently known exactly when the White scheme was adopted for the Sunderland but it would appear to have been sometime in the first half of 1942. Evidence for this is to be found in the provisions of AMO A.664/42.

AMO A.664/42 was dated 2 July 1942 and gave two separate schemes for RAF Flying Boats. The first scheme was for Flying Boats, Floatplanes and Amphibians (other than Target Aircraft) which were to be camouflaged with the Temperate Sea Scheme on the upper surfaces and Sky on the

National markings were to consist of Red and Blue roundels on the upper surface of the wings, Red, White, Blue and Yellow roundels on the side of the fuselage with a standard fin marking on the fin. The serial number was to be Night and the code letters Light Slate Grey. The regulations regarding the size of the code letters remained unchanged as they were still to be 48 inches high with strokes 6 inches wide.

Squadron codes deleted

On 23 June 1942, a letter was sent from the Deputy Director of Air Tactics at the Air Ministry to Bomber Command, Fighter Command, Coastal Command and Army Co-operation Command, headed 'Squadron Code letters on Aircraft'. The letter stated that the Deputy Director of Air Tactics had been directed to refer to the use of squadron code letters on aircraft and to inform the Commands that it was now considered that the application of such markings were defeating all efforts by W/T security to conceal the Order of Battle.

Unless there were overriding reasons to the contrary, the squadron code letters were to be abandoned and the views of the Commands were therefore sought as a matter of urgency.

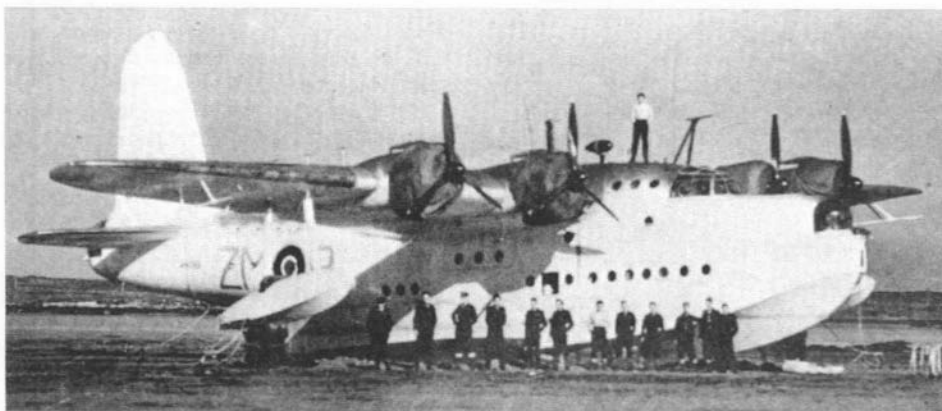
HQ Coastal Command sought the opinions of their operational Groups by letter on 27 June 1942 and by 10 July were able to write back to the Air Ministry to inform them that Coastal Command could find no good reason for the retention of the two-letter squadron codes. It was however strongly recommended that single letters be retained for ease of identification of individual aircraft within squadrons as this would not appear to affect security.

Following consideration of all the replies received from the Operational Commands, on 26 September 1942 a letter was sent to all Operational Commands at home and overseas which stated that with the exception of Bomber and Fighter Commands it had been decided to dispense with the two-letter squadron codes as a means of identification on security grounds. It was therefore requested that instructions be given by each affected Command to this effect as soon as possible.

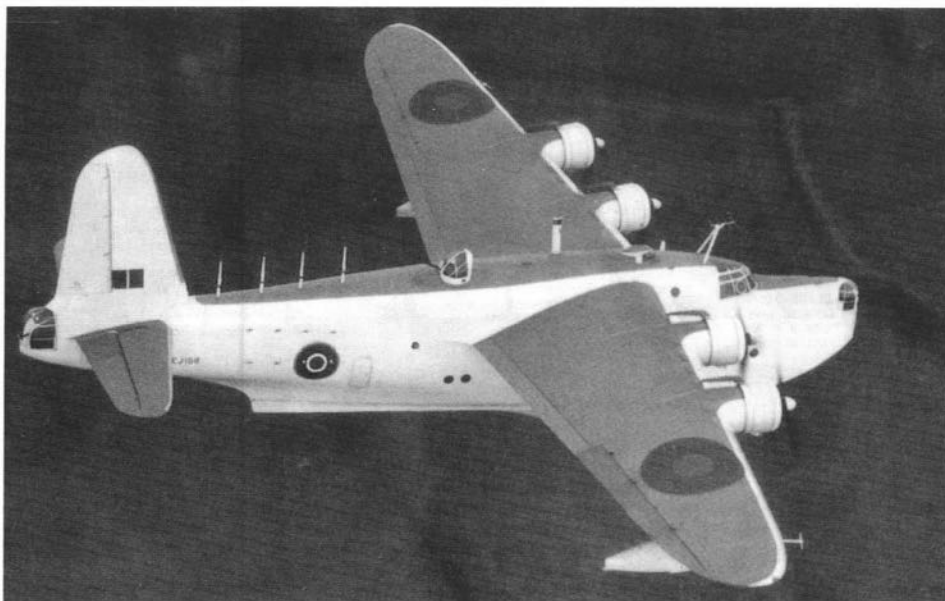
On 4 October 1942 HQ Coastal Command

under surfaces. National markings were to consist of Red and Blue roundels on the upper surface of the wings, Red, White, Blue and Yellow roundels on the side of the fuselage with a standard fin marking on the fin. The serial number was to be Night and the code letters 'dull red'.

AMO A.664/42 then went on to specifically mention the Sunderland Flying Boat separate from the Flying Boat category as described above stating that Sunderland aircraft were to be finished in the Temperate Sea Scheme on their upper surfaces with White under surfaces.



A somewhat cleaner-looking Sunderland Mk III, in this case W6055 ZM-R of No 201 Sqn, photographed in September 1942, in the Temperate Sea Scheme upper surfaces with White under surfaces to Pattern No.2. This may have been the result of a recent 'in service repaint' over the original Temperate Sea Scheme upper surfaces to Pattern No.1 with Sky under surfaces (IWM)



Sunderland Mk III EJ168 'J' of No 343 (Free French) Sqn RAF in a pristine factory-finish Extra Dark Sea Grey upper surfaces and White fuselage sides and under surfaces to Pattern No.2 scheme. Note the White leading edges of the mainplane and how they curve around the wingtip and the White mid-upper turret (Short Brothers)

wrote to the Air Ministry to inform them that following their letter of 26 September, all concerned in Coastal Command had been informed that they were to dispense with the two-letter squadron codes with effect from 1 November 1942.

Instructions had also been issued however that the third aircraft letter be retained for individual aircraft identification within a squadron and Air Ministry approval was sought for this practice. Thus it would appear that from November 1942 Coastal Command's Sunderlands only carried an individual aircraft letter with no form of squadron marking.

Almost inevitably, this was found to lead to some confusion on Coastal Command Stations where more than one squadron was operating a similar type of aircraft. The solution was to reintroduce a form of squadron marking, and this will be dealt with below.

Temperate Sea Scheme eliminated

Having disposed of its squadron markings, further changes were afoot with regard to the colour scheme of Coastal Command's aircraft. On 30 December 1942 HQ Coastal Command wrote to the Air Ministry to state that the camouflage of Coastal Command aircraft had been under review

in the light of its wartime experience. As far as the Sunderland is concerned, the most relevant part of this review was the proposal that the disruptive pattern Temperate Sea Scheme be eliminated from the upper surfaces of all Coastal Command aircraft. HQ Coastal Command considered this pattern to be of no advantage and required much extra effort be expended in its application. It was therefore proposed that a single plain colour, Extra Dark Sea Grey, be used in its place.

It was also proposed that where different colours met, they should do so in a straight line without what is described as 'waving' or other form of merging and that the under surface colour should always be carried up just over the leading edges of the mainplanes. Thus it was proposed that the Sunderland be camouflaged in Extra Dark Sea Grey and White to Pattern No 2.

These proposals were approved by the Air Ministry who notified all interested parties by Postagram on 2 February 1943. As far as the Sunderland was concerned the upper surfaces were to be Extra Dark Sea Grey, the side surfaces were to be matt white and the under surfaces were to be glossy White. De-icing equipment fitted to the leading edges was to be painted in Aluminium paint thus apparently contradicting the earlier

instruction that the de-icing equipment be painted White. Perhaps the most likely explanation for this is that demand had outstripped supply. Where de-icing equipment was not fitted, the white under surface finish was to cover the whole of the leading edges viewed from ahead when the datum line of the aircraft was horizontal. Spinners, frontal areas and engine cowlings were to be White. Standard national markings were to be carried and both code and serial number markings were to be Light Slate Grey.

DTD Technical Circular No 360

This scheme was incorporated into DTD Technical Circular No 360 'Camouflage and Identification marking of Aircraft' when it was issued during 1943. Appendix No 5 'Colour Scheme for Aircraft Engaged on Coastal Duties' stated that aircraft engaged on coastal duties with the exceptions of Photographic Reconnaissance, Meteorological, Air Sea Rescue and other Special Duties were to have their upper surfaces camouflaged in Extra Dark Sea Grey only except where White was specified.

Under surfaces as defined by Pattern No 1 including the under surfaces of the wings and tailplane were to be glossy White whilst the under surfaces between the boundaries which defined Pattern No 1 and Pattern No 2 were to be matt White.

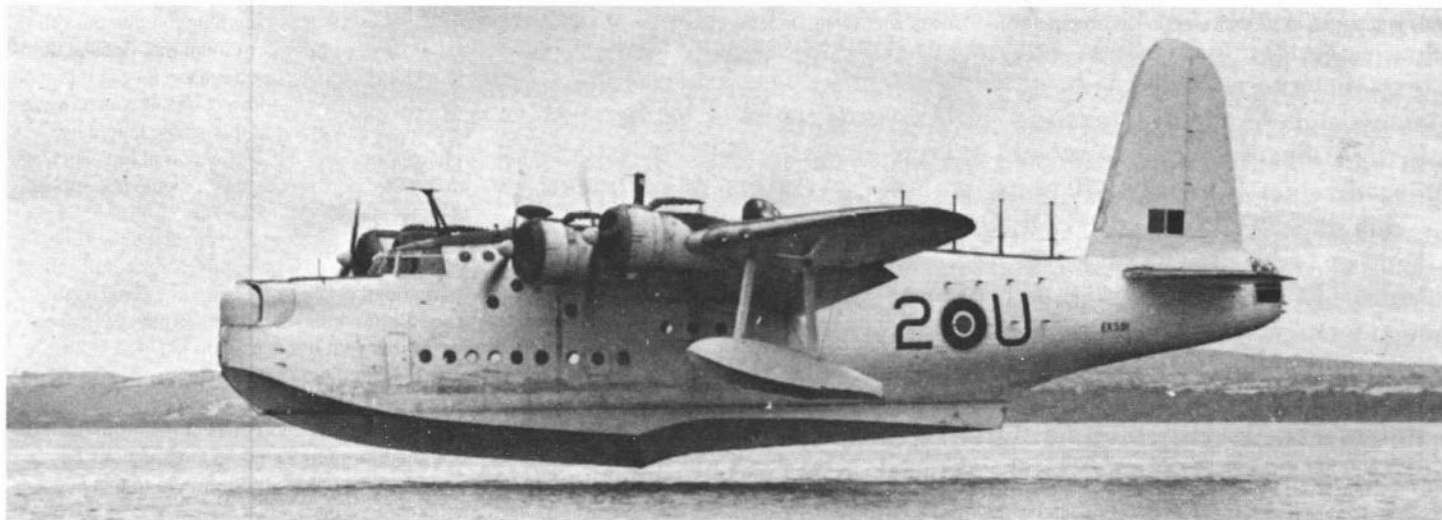
In addition to this, the white finish was to be extended upwards and merged into the upper surface camouflage in such a way that when the aircraft was seen from front and side elevations, the aircraft was to appear to be almost entirely white.

On the engine nacelles, the white was to be extended upwards to cover the whole of the top surface forward of the wing leading edge. Fins, rudders and spinners were to be matt White.

Definition of gloss White

The glossy White finish called for was obtained in different ways depending upon the material from which the airframe components were made and whether the aircraft was a landplane or flying boat. Where a cellulose finish was used, for example on a fabric covered component such as an elevator, or on a fabric covered aircraft such as the Wellington, the matt White finish bestowed by DTD 83A or DTD 308 was to be given a final coat of transparent covering to British Standard Specification 2D 101 Vocabulary of Stores reference No. 33B/83, 84, or 85.

Where a synthetic finish was used, mostly on



Sunderland Mk III EK591 2-U of No 422 Sqn RCAF in the Extra Dark Sea Grey and White scheme to Pattern No 2, sporting the alpha/numeric squadron code introduced in the spring of 1942 (RCAF)

metal components and airframes, the gloss White finish was obtained by the application of White paint to DTD 260A, a pre-war material Specification for Pigmented Oil Varnishes and Primer for Metals and Timber, which dried to a gloss finish.

Definition of matt White

Where matt White was called for, standard camouflage finishes to DTD 83A and DTD 308 were applied to fabric and DTD 314 or DTD 517 to metal.

Flying boats were treated in the same way as landplanes, but the underwater surfaces of the hull and wing tip floats were to be first given a coat of White anti-fouling paint to Specification DTD 420B Vocabulary of Stores Reference 33B/367, followed by a coat of White, Stores Reference 33B/463.

As far as the Sunderland is concerned, it might be reasonable to assume that the demarcation between the gloss White under surfaces and the matt White sides followed a similar line as the demarcation between the Temperate Sea Scheme and Sky under surfaces did in the earlier scheme. The author would be interested to hear from anyone who might possess a works camouflage scheme diagram for a Sunderland who can either confirm or refute this hypothesis.

Special types of White paint were applied to those parts of the airframe which required a white finish to which the standard range of DTD Specification paints would not adhere. Where aircraft such as the Sunderland were fitted with Rubber De-icing Sheaths on the leading edges of the wing, Flexible White paint to DTD 557, Vocabulary of Stores reference 33B/505 was to be applied. Engine exhaust shrouds were to be given a White finish using ICI (Paints) Ltd anti-glow paint 143/2037 or alternatively Jenson and Nicholson's anti-glow paint. It is interesting to note that both these anti-glow paint finishes were defined by the same Vocabulary of Stores Reference Number 33B/528.

Onto this basic Extra Dark Sea Grey, matt White and gloss White camouflage scheme, standard national markings were applied in the form of National marking I on the upper surface of the wings and National marking III on the sides of the fuselage. No mention was made of fin markings, but photographic evidence shows that the standard Fin marking (i) was applied. The code letters and serial numbers were to be applied in Light Slate Grey.

It is of interest to note that although the Lanolin finishes outlined above appear to have been retained in the Vocabulary of Stores, indeed being included in DTD TC No 360, the Appendix dealing with aircraft engaged on coastal duties outlined above makes no mention of them, instead implying that Flying Boats were painted using the same materials as landplanes with the exception of the anti-fouling paint which was stated to be to DTD 420B. The reason for this is unknown.

It is not known exactly when this new scheme was introduced on the production line but once introduced, the Extra Dark Sea Grey and White scheme remained in use on Coastal Command Sunderland Mk IIIs until they were withdrawn from service during 1945.

Squadron markings reintroduced

As mentioned above, whilst the decision to remove the two-letter squadron codes from Coastal Command aircraft might have improved operational security, it also had the effect of causing confusion on Coastal Command stations

which operated more than one squadron of a similar type of aircraft. To prevent this, from circa mid-1943 a system of numerical codes was therefore introduced.

To take an example, Pembroke Dock was the home base of Nos 228 and 461 Sqns, both of which operated Sunderlands. One aircraft on each squadron might be coded 'A'. In order that everyone from air traffic controllers to the maintenance crews could tell to which squadron an aircraft coded 'A' belonged, No 228 Sqn therefore adopted the numerical code '1' whilst No 461 adopted the numerical code '2' so their aircraft might be coded '1-A' and '2-A' respectively.

Very soon after these codes had been adopted, their continued use appears to have been under review as between 20 and 30 October 1943 the question of reintroducing the two-letter squadron codes arose. This is thought to have come about as a result of the formation of the first Coastal Command Strike Wings which had the same tactical needs as the Fighter and Bomber Command squadrons which had been allowed to retain their codes, for example allowing aircraft from the same squadron to reform following an attack.



Sunderland Mk III ML747 2-N of No 461 Sqn RAAF in the Extra Dark Sea Grey and White scheme to Pattern No 2, also sporting the alpha/numeric squadron code introduced in the spring of 1942 (D Roberts)

The perceived need for a return to the two-letter squadron codes was not only felt necessary by the Strike squadrons however, as on 20 October 1943, No 201 Sqn, 422 Sqn and 423 Sqn, which were all equipped with Sunderlands in 15 Group, notified HQ Coastal Command that they also wished to re-employ the two-letter codes.

In the event it would appear that the Strike Squadrons got their wish as they were allowed to return to using the old two-letter system whilst the rest of Coastal Command had to wait until July 1944 before they too were allowed to return to using the two-letter squadron codes.

When the return was made to utilising the two-letters as squadron markings, some squadrons were allocated new letter combinations. For example No 423 Sqn had originally used the code combination 'AB' on its Sunderlands before dropping them circa November 1942. The squadron then used the number '3' on its Sunderlands from mid-1943 until the two-letter codes were reintroduced in July 1944. When the two code letters were reintroduced from mid 1944 however, No 423 Sqn was allocated the letters 'YI'

Throughout this period there appears to have been some measure of confusion within the RAF as to what colour the squadron codes should be applied since AMO A.664/42 with its instructions

to apply code letters to Flying Boats, Seaplanes and Amphibians in Red but to Sunderlands in Light Slate Grey remained in force until the issue of AMO A.864/44 on 7 September 1944.

The new instruction referred the reader to DTD TC No 360 and the instructions contained therein as described above. Thus from circa April to at least circa late 1944 if not until the end of the war in Europe, it might have been possible that a Sunderland finished in the White scheme might be seen to have had its squadron markings, in whichever form they took, applied in Red rather than Light Slate Grey.

The Sunderland was not affected by the provisions of SHAEF Operational Memorandum No 23 which gave details of the black and white distinctive markings which were applied to Allied aircraft for the D-Day Normandy landings in June 1944 which were then retained in one form or another until the end of the year.

In January 1945, following the removal of these distinctive markings, the RAF was encountering some difficulty with its aircraft over Europe being misidentified as hostile by some of its erstwhile allies and this continuing difficulty in identifi-

cation led to the adoption of a new roundel on the upper surfaces of the wings of Sunderlands.

In the light of continuing difficulties in identification of RAF aircraft it was decided to revert to a red, white, and blue roundel on the upper wing surfaces. Accordingly Cypher AX 110 dated 2 January 1945 from the Air Ministry to all RAF Command Headquarters at home and overseas, Air Staff SHAEF, Headquarters 2nd TAF et al gave notice that with effect from 7 January all aircraft other than those whose primary role was night operations, and aircraft operating in Air Command South East Asia and the Pacific were to revert to red, white, and blue roundels on the upper surfaces of the mainplanes in place of National marking I.

Because of the need to replace a large number of different sized National marking Is with the new roundel, no comprehensive list of measurements was given. Instead the size of the roundel was given in fractions of R where R was the radius of the upper wing roundel specified for any particular type of aircraft. The overall diameter of the new roundel's Blue segment was to be the same as the roundel it replaced with a White segment half the overall diameter of the roundel, and a Red segment three-eighths the overall diameter of the roundel.

These proportions were in fact the same as those of the National marking II roundel which had been adopted for use on the under surface of the wings at the same time as the fuselage roundel and fin marking had been revised in 1942 as described above. Wartime Sunderlands did not carry these roundels as no under wing markings were specified for the type

However, apparently because DTD Technical Circular No 360 and AP2656A specified only three fixed sizes for National marking II, and the new roundel was required in a much larger number of different sizes to suit many different types of aircraft, the new red white and blue roundel was given the official designation 'National marking IA'.

As applied to the Sunderland, the new National marking IA remained the same size as the earlier Red and Blue National Marking I with an overall diameter of 112 inches. This new marking became the standard upper wing marking for the rest of the war and remained in use until circa 1947.

From war to peace

With the end of the war in Europe, the Sunderland III passed from Coastal Command service comparatively quickly in favour of the Sunderland Mk V. It is therefore unclear how many, if any, Sunderland Mk IIIs remained in squadron service long enough to receive the Night underwing serial numbers which were introduced from 26 July 1945 by AMO A.766/45 'Marking of Registration Numbers on Aircraft'.

The stated aim of this AMO was to facilitate the identification of low-flying aircraft by reintroducing



Sunderland Mk III ML884, DG-Z of No 422 Sqn RCAF in the Extra Dark Sea Grey and White scheme to Pattern No 2, circa late 1944, sporting the then recently re-introduced two-letter squadron codes DG – possibly in Light Slate Grey or Red. Close examination of the photo will reveal the lighter 'colour' in the background of the letters 'G' and 'Z' where the previous alpha/numeric code was overpainted (RCAF)

the practice of painting registration numbers on the undersides of the mainplanes, and was to be reintroduced for all RAF aircraft in the inactive Theatres of Operations. All units at home and overseas, other than those engaged in active operations against the enemy, were to immediately arrange for the marking of aircraft in accordance with the instructions detailed in the order.

Notes on the Airfix Sunderland Mk III kit's scheme

The Airfix Short Sunderland III was first released in 1960 and unlike many of the other kits in the Airfix range which have been subsequently reissued with different camouflage and marking options, this kit has only ever featured the one colour scheme option. This is for a Sunderland Mk III,

DD867, coded '2•G' in a Temperate Sea and White scheme of an unidentified squadron and date.

When the kit was first issued, there appears to have been some confusion over the identity of DD867's parent squadron, but since then it has become apparent that this was No 422 Sqn RCAF based at Castle Archdale in Northern Ireland. The precise date would appear to still be open to question as DD867 appears to have spent a year between August 1943 and August 1944 with No 423 Sqn RCAF which also based at Castle Archdale.

It is thought that this colour scheme was based upon a photograph from the Imperial War Museum collection which had been 'got at' by the censor to the extent that the aerial array for the ASV radar and even the mid-upper turret had been eliminated from the print. No parts for the ASV radar array are provided in the kit although there is a mid upper turret!

The painting instructions included in the current issue of the kit have only been revised to the extent that the paint numbers have been changed from those of the original Airfix paint range to the Humbrol range as it existed some 20 years ago, which are also now out of date!

It would appear that there are at least three errors in the kit painting instructions. The first is the assertion that the bottom of the hull below the chine should be painted light grey. As far as is currently known, this was never a part of the officially sanctioned colour scheme for the Sunderland Mk III.

The second error is one of omission, in that no mention is made of the practice of applying gloss White to the under surfaces and matt White to the side surfaces of Coastal Command aircraft finished in the 'White' scheme.

The third error is that it is suggested that Humbrol 102 be used to represent Dark Slate Grey. This colour is now available from Humbrol as No 224.

The instructions appear to have been recently reprinted to incorporate the Hornby Hobbies legend, so it is difficult to see why the instructions were not updated to take account of the revised paint number at the same time.

Without access to the original photograph upon which the kit instruction drawing is based, it is not possible to comment on some of the finer details of the scheme depicted, such as the colour of the de-icer boots on the leading edges of the wings and tail which might have been black as depicted, silver or white; the precise demarcation line between the upper surface Temperate Sea Scheme camouflage and the White under surfaces; or the colour of the exhausts. **IMAM**



Sunderland Mk III ML778, NS-Z of No 201 Sqn in the Extra Dark Sea Grey and White scheme to Pattern No 2, circa May 1945, showing the two-letter squadron code presentation and the Red/White/Blue National marking IA upper wing roundels introduced in January 1945. The code letters appear to be Red (IWM)



Bristol's Fighter

Tony Beesting builds Eduard's superb Bristol F.2B Fighter

The Bristol F.2B was designed by Frank Barnwell in 1916 as an aircraft in the same class as the R.A.F. R.E.8 and the Armstrong Whitworth F.K.8, ostensibly as a replacement for the R.A.F. B.E.2c. The definitive F.2B was powered by the Rolls Royce Falcon III V12 engine developing 275hp and giving a top speed of 123mph at 5000ft. Rate of climb was 889ft/min with a ceiling of 18,000ft. Armament was one synchronised forward-firing 0.303 Vickers machine gun, operated by the pilot, and one, (sometimes two), flexible Lewis gun(s), mounted on a Scarff ring in the observer's cockpit. There was also the capacity to carry 240lb of bombs.

The type first flew in September 1916 and entered into service with the RFC in April 1917. When initially deployed, the aircrews were

instructed to fly in formation and use the crossfire of the observers' guns as a defence against any threat from the enemy. These tactics proved to be catastrophic; on the first engagement with the enemy, a patrol of six aircraft ran into five Albatros D.IIIs – of the six aircraft, four were shot down and a fifth badly damaged, with no loss to the enemy.

More aggressive tactics proved that the type was by no means ineffective, it was fast and manoeuvrable enough to be flown in the same manner as a single-seat fighter, the principle weapon being the forward firing machine gun with the added bonus of a 'sting in the tail' from the observer's gun(s). Flown in this manner, the Bristol Fighter was a formidable opponent for any German single-seater.

The type continued in service in the post-World War One RAF until 1932 and was finally

retired by the Royal New Zealand Air Force in 1936, a truly impressive record.

Eduard's Bristol Fighter

Eduard's 1/48 scale kit comprises four sprues, an etched fret, a set of masks, a small sheet of acetate, a separate sheet showing markings for four aircraft in full colour and an A5, eighteen-page, booklet with parts plan, rigging diagram and a twelve-step build sequence, included in a sturdy top opening box. All the parts are separately bagged, nice.

The box art depicts two aircraft in flight and is worth keeping to frame and hang on the wall. The plastic parts are nicely moulded with no flash or sink-marks visible, the fabric effect on the wings and the stitching on the fuselage is particularly well done. Sprue D is crammed with small delicate parts... I can hear the carpet monster salivating already.

The build

The first task was a trip to the internet for any reference material that I thought may be useful. One thing that was obvious was that the rigging diagram was incorrect – the termination point of the inner flying wires is shown just below the cabane struts, the box art is a far better representation. There are also some very good photos of the aircraft in the Shuttleworth collection, which show the control cables to the rudder and elevators to be double as are the flying wires, but everything else looked fine, nice one Eduard.

Being a relative newcomer to modelling I am continually trying and learning new tricks. Every model is a journey into the unknown! One of the



Detailing the cockpit interior



"The type first flew in September 1916 and entered into service with the RFC in April 1917..."

tricks I have learned is to be patient and plan ahead, not jump in with both feet hoping that everything will turn out fine. It usually doesn't and it's always my own fault, I always have some sort of a disaster. But this time, it was going to be different...

The next task was to unpack the contents of the box, fondle the plastic and mentally build the thing. Some of the parts on the etched fret were so small to be in the 'you must be joking' category. The way the lower wing is attached to the fuselage looked particularly daunting, (more of that later), and the method of mounting both the pilot's and observer's seats along with seat-belts looked to be highly improbable. Some re-engineering seemed appropriate.

Now to building the thing. I started with the pilot's seat, or at least, its mounting. The seats are set on a very fragile framework that locates in tiny dimples in the fuselage sides, any error in length or too much glue was going to result in a disaster, the ends of the framework would just melt. Even if I did manage to get one end in place, being a clumsy oaf, it would probably get knocked off before the fuselage halves were joined.

I felt that joining the fuselage halves and locating the other ends in their respective dimples all at the same time would drive me to the point of insanity. So, I cut some slices of plastic tube that were a close fit over the ends of the framework, positioned them over the dimples with some brass rod of the same diameter and glued them with Tamiya extra thin glue, withdrew the brass rods and let the glue set. A practice run using Maskol as an adhesive proved that I could fix one side in place and join the fuselage halves, repeat-

edly, without too much drama. Result!

I used the same technique for the observer's seat and a length of brass rod to which I would attach the pilot's shoulder straps at a later date.

You are provided with three options for the pilot's seat; an injection moulded item which I would have been quite happy with, an injection moulded cushion and padded backrest with the basket-weave portion in etched brass. (two pieces showing the basket weave effect visible from both the pilot's and observer's cockpit), and the full monty, all brass with the plastic backrest. I opted for the second alternative.



The fuselage halves joined



The fuselage painted and finished awaiting the wings

I rolled both pieces to a radius using a piece of 8mm diameter steel rod, rolling back and forth over the brass as you would with a rolling pin, using a cutting mat as a backing. A bit of patience and I was rewarded with a nice true radius which conformed to the seat cushion almost perfectly. Gluing it all together was fiddly but the final result was worth the effort. Airbrushed with Tamiya Deck Tan and given a wash with Citadel colour Brown ink for the basket weave then Black ink for the seat cushion – it looks okay to me.

The rest of the cockpit went together with very few problems, just plenty of dry-fitting, as everything 'just fits' albeit with a little plastic to remove in places to get it all snug, no bad thing as at least you are not left with any unsightly gaps to spoil the overall effect. The engine is represented by three panels which when painted 'metallic' and given a black ink wash, are glued in to place. The only bits to be seen are through access ports giving the illusion of a complete engine – very effective.

The pilot's lap belts were fixed to scraps of plastic card glued to the fuselage sides, not to the seat, as this mimics the real thing – fiddly, but not as bad as I had feared. I must admit to not using the etched brass cocking lever and handles on the ammunition drums, they were too small for my fat fingers.



Close-up of the radiator louvres on the cowling front

The cockpit was painted as per Eduard's instructions. I used Citadel's Bestial Brown for the wood framing, Deck Tan and then Clear Orange for the instrument panel. Eduard supply transfers for the dials which look quite effective.

After a coat of matt varnish to 'bring it all together', I finally fitted the seats and shoulder strap anchorages to one side of the fuselage with a spot of PVA in the sockets, using the opposite side for alignment. I treated each item in turn and waited for the glue to reach 'handling strength' before progressing to the next one. I posed the seat belts on the fixed side and tacked the loose ends down with a dab of Johnsons 'Klear/Future', applying a little pressure with the end of a cocktail stick.

The fuselage halves came together without any problems. I taped the halves together and ran some Tamiya extra thin glue into the joint, treating each section in turn, then removed the tape, clamped it all together and left the glue to cure. When fully cured I poked the remaining seat belt in place then sanded the joints. A little filler was needed here and there, not to correct any mismatches, but just to hide the seams. A quick brush with silver paint, let it dry and sand again, and job done.

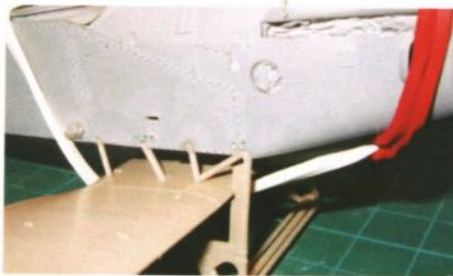
Next came the piece of decking that forms the observer's cockpit, which needed a fair amount of trimming to get a good fit. It really needs to fit well before gluing in place as it is surrounded by fine detail, (ie stitching), which would disappear with sanding and be very difficult to reinstate. This is probably the only criticism I have of the way the kit is engineered. Had this piece of decking been extended further aft, the resulting joint would have been much easier to fill and sand.

The radiator assembly consists of five parts; you are given the option of showing the cooling flaps 'open' or 'closed', I chose 'open', as I liked the idea of seeing the brass radiator through the cooling flaps. I used Gunze MC219 for the brass, it looks just like brass to me, and when assembled the effect was better than I'd hoped for. With a quick fettle the assembly popped into place. The

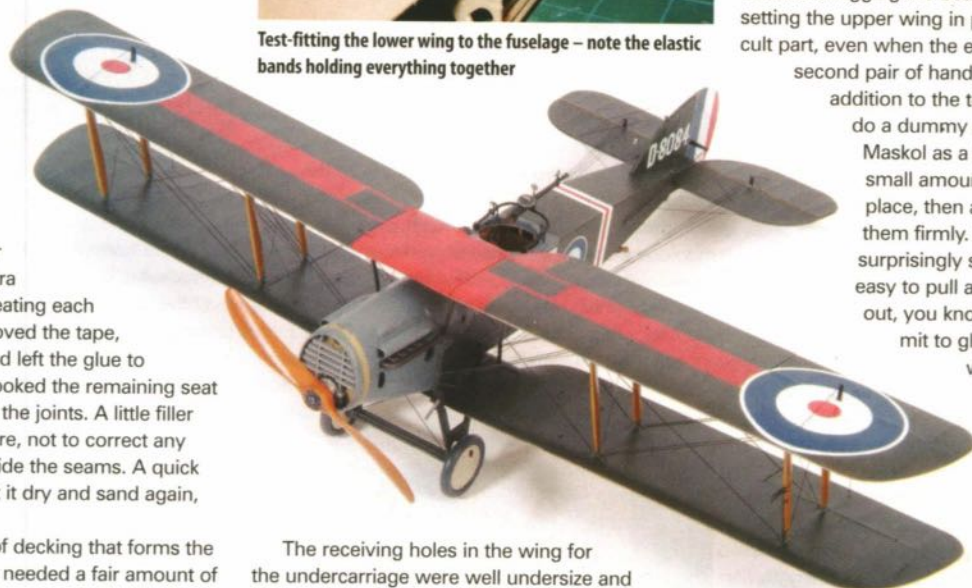
stabilisers and fin followed the same pattern (this could get boring) a rub with a Swiss file and the stabiliser slides neatly in place, the fin fitted perfectly in its locating holes. We almost have a fuselage, minus the easy to knock off bits.

The time to fit the lower wing was here and I had anticipated lots of problems, but my fears were completely unfounded, Eduard's engineering is spot on. I cleaned all the parts up and checked the fit of each strut in its respective location, each one needed fitting but with care, could be made to just push into its locating socket. I fitted the forward V strut to the fuselage using the wing and Mk 1 eyeball for alignment, applied Tamiya extra thin to the fuselage only and let it cure, then I fitted the rear struts in place, checked alignment and glued them to the wing only.

Dependent on which aircraft you are building, you have a choice of two styles of undercarriage in fact, the only other decision you need to make during the build is this and the exhaust system applicable to the version you are building; the version with long exhaust needs some holes drilling in the fuselage to receive its mounting brackets, which didn't apply to the aircraft I had chosen which was the one depicted on the box art.



Test-fitting the lower wing to the fuselage – note the elastic bands holding everything together



The receiving holes in the wing for the undercarriage were well undersize and needed opening up. I have a set of watchmakers' reamers which are handy for this type of operation, just twist and push and the excess material is removed, with care you can achieve a nice snug fit. Once fitted, I clamped the whole assembly in place, not forgetting to add the wheel axle, and ran some Tamiya extra thin into the wing-to-undercarriage strut joint and left it to cure. When set, I glued the axle in place, job done.

I had hoped to add the elevators and ailerons before painting, so the control horns were fitted, after the customary swipe with a sanding stick to get a snug fit, and then the elevators were glued in place. They are connected to the stabilisers by four small lugs which looked extremely fragile, which they proved to be; after breaking the eleva-



The lower wing in place with cabane and inner upper mainplane struts positioned...

tors off twice, I put them on one side to be added later. Before painting there were odd bits and pieces that could safely be added before painting, bits of etched brass and four very small control horns which I assumed would control the angle of incidence of the stabilisers. The etched brass was set in place using Johnsons Kleer as an adhesive – this stuff has all sorts of uses.

I have to admit to not having yet mastered the art of stretching sprue, preferring to use fishing line or similar for rigging, which means drilling lots of small holes to accept the threads. I do feel that this method, although not without its problems, results in a stronger model more able to withstand any rough handling it may receive. With that in mind, I marked the positions of the ends of the rigging wires in both wings and the fuselage, and 'dimpled' them with a 0.75mm drill in preparation for drilling after painting.

It would appear that lots of modellers are put off building biplanes because of the perceived difficulties of rigging the beast. Personally, for me, setting the upper wing in position is the most difficult part, even when the engineering is good. A

second pair of hands would be a welcome addition to the tool-kit. I find it pays to do a dummy run first using Humbrol Maskol as a temporary adhesive, a small amount to set the struts in place, then a good dollop to hold them firmly. When cured, it gives a surprisingly strong joint that is still easy to pull apart later. If this works out, you know it should safe to commit to glue – if not, at least you won't have any nasty surprises later.

Painting

Painting was uneventful, I masked all the holes with either tissue or Blu-Tack then primed the whole lot with Tamiya XF19 Sky

Grey, really just as a final check

for any blemishes that needed attention, for the engine cowling, I used XF66 Light Grey and for the green, XF61 Dark Green. The clear doped linen surfaces were sprayed with my own secret mix – it's a 'secret' because I don't actually know what it consists of! It started with Tamiya Buff, lightened, then Deck Tan added, a drop or two of Flesh, then some yellow then more white to taste. When the bottle is empty, I'll have to mix something else.

The red markings on the upper wing were masked and sprayed with XF7 Red. Although masks are supplied for this, I found it easier to use Tamiya tape. The brass band around the cowling

was masked and sprayed with Gunze metal colour MC219 Brass.

After a few coats of Johnsons 'Klear/Future', the decals were applied to the fuselage and upper wing. They went on beautifully, easily sliding into place, then snuggling down without the use of any setting solution. I did use some setting solution when they were dry but they didn't really need it, wonderful.

Before fitting the wings I drilled all the holes ready to accept the rigging,

Rigging

Those in the upper wing were drilled blind, those in the lower wing, right through, the holes in the fuselage that would accept the flying wires were drilled right through the fuselage at an angle of 45 degrees to emerge beneath it, a long way, but it would allow me to tension the wires when glued in place.

The only holes to go through the upper wing were the diagonal bracing wires around the cabane struts. Wherever possible, the holes were drilled at the same angle as the wires would appear to be attached. To add interest, I like to vary the size of fishing line that I use, for the flying and landing wires. I used 0.18mm dia, self-coloured brown, all the rest were invisible mending thread, 0.10mm dia, coloured with Tamiya Smoke.



After removing paint from the mating surfaces, the lower wing just popped into place. I do like it when a plan comes together. When cured, I started with the front cabane struts, set them in place glued to the fuselage only when the glue had a decent hold but was still workable. I added the rear cabane struts and set the wing square and with the right amount of stagger using the 'Mk 1 eyeball'.

I lifted the wing off and let the glue cure fully. The same procedure was used for the inner interplane struts. When fully cured, it was possible to lift the wing on and off fairly easily – result!

I fitted the rigging to the upper wing with thin superglue, taped the wires out of the way so as not to interfere with fitting the



... front view of the lower wing in place with cabane and inner upper mainplane struts positioned

wing. I set the wing back in place and, working from the cabane struts outwards, ran in Tamiya extra thin glue. Light finger pressure was enough to hold the wing until the glue started to cure. When fully cured, I added the outer interplane struts, they more or less just popped into place. I used Tamiya extra thin glue throughout – magic stuff! Used sparingly with the brush supplied, it doesn't affect the surrounding paint and cures to a good firm joint.

With the wings in place, rigging is just a matter of threading each wire through its respective hole, then, working symmetrically from the fuselage outwards, after applying a little tension each wire was fixed with a drop of thin superglue. Painstaking, but not difficult. After checking that each wire was secure, I shaved off the excess with a new No.15 blade and touched up each point with a brush. Job done.

Before adding the elevator control arm, I drilled a 0.3mm hole in each end ready to receive the double flying wires, and painted it black. When dry, I cleaned out the holes and glued it in place. The ailerons, elevators and rudder were added, (all pre-painted), and finally the tailskid.

This rigging was completed with 0.1mm dia invisible mending thread, pre-coloured with a black marker pen. I started with the double wires to the elevators. I threaded

the wires through the holes in the control arm, drew a good length through, applied some tension with my fingers and set them in place with a drop of superglue. A small nick with a razorsaw in the control horn was sufficient to locate them. Again, some tension and a drop of superglue set them in place. The double wires to the rudder received the same treatment. All that was left were some wires between the tail fin and the stabilisers and the tail rigging was complete.

The ailerons were rigged with one length of thread starting in a blind hole in the lower wing, over the top of the control horn, (located in a nick),

"The clear doped linen surfaces were sprayed with my own secret mix..."

through the holes in the lower and upper wing, over the top of the control horn, again located in a nick, and finally through a hole in the upper wing. Some tension and a drop of superglue at each contact point, then the end was shaved off with a scalpel – job done.

I added the propeller, exhausts, wheels, wing fenders and windscreen, leaving the observer's gun and its mounting until last. I'm not particularly adept at handling etched brass, other than control panels and flat parts that are just glued in place. When it comes to bending and folding and gluing,

I usually end up with a mangled mess.

The assembly consists of two injected parts and two etched parts that are folded to represent the quadrants that provide height adjustment for the gun mounting, plus another etched part that I assumed to be an adjustable back-rest. I constructed a simple fixture to hold the Scarff ring

leaving both hands free to manipulate the parts.

The assembly went together without any problems, which goes to prove that two hands are better than one. The gun was added including the etched sight and when painted and drybrushed really looked the part. The whole assembly just pushes into the aperture in the observer's cockpit, no glue needed.

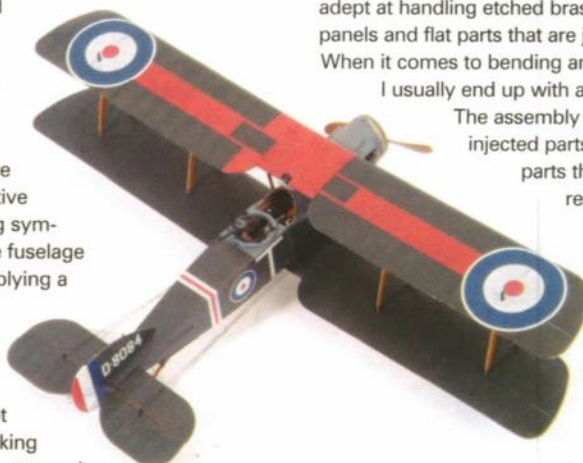
I managed to lose the small propeller that is attached to the generator mounted on the port side undercarriage leg. I fabricated another from a scrap of etched brass set in place with a dab of superglue. A few coats of

satin varnish to bring it all together and the model was complete.

I have to say I thoroughly enjoyed this build and am highly delighted with the finished result. As far as I am aware it is an accurate

representation of a Bristol F.2B Fighter. There are no problems with fit and the whole thing is a joy to put together.

Well done Eduard, more of the same please. Would I build another? Well when the pending pile is a little smaller, a resounding yes, not arf! **MAN**





The Condors of KG 40

Ian Day builds Trumpeter's Fw 200

KG 40 was the Luftwaffe's premier maritime bomber unit. Involved in the war at sea from 1940 until the end of hostilities, this iconic unit was responsible for one aircraft's reputation in particular – the Focke Wulf Fw 200 Condor, although various Staffeln of the unit were equipped with various other aircraft types, such as the Dornier Do 217, Junkers Ju 88, Heinkel He 111, He 177 and the Messerschmitt Me 410.

port into a maritime reconnaissance aircraft for the Japanese. Seizing the opportunity, the design team at Focke Wulf drew up a conversion of the basic airframe to create the Fw 200C reconnaissance bomber.

Accepted with alacrity by the Luftwaffe, preparations were made to begin assembly at Focke Wulf's plant at Cottbus. Other than some local strengthening to the airframe and the addition of BMW 132H engines, the aircraft was virtually unchanged from the civilian Fw 200B. Vari-

over the Bay of Biscay and around the far coast of Ireland, attacking targets of opportunity. By September, fifteen aircraft were on strength and KG 40 had sunk over 90,000 tons of shipping. On 26 October, aircraft damaged the Empress of Britain 70 miles northwest of Donegal bay. The ship was later sunk by U-32.

By the end of 1940, some twenty-six machines had been built, allowing KG 40's strength to be built up. Nevertheless, losses were heavy, only the first pilot had any armour protection and the airframe was simply not stressed for combat operations. It was very rare if more than six aircraft were available for operations at any given time.

In January 1941, III./KG 40 was formed and due to the lack of available Fw 200s, the Gruppe was equipped with He 111H-6 aircraft.

By the end of March 1941, Condors of KG 40 had accounted for some 363,000 tons of shipping, and the importance of the air war over the Atlantic was recognised by the Germans with the formation of *Fliegerführer Atlantik*. Com-



In 1939, the Oberkommando der Luftwaffe woke up to the fact that the Luftwaffe had no aircraft capable of long range maritime reconnaissance or the ability to harass merchant shipping in the North Atlantic. Scouring around, they discovered that the Focke Wulf Werke was in the process of adapting the Fw 200 commercial trans-

ous refinements to the cowlings were undertaken and the landing gear was equipped with twin mainwheels.

The initial production batch, essentially the C-0 sub-type, was completed as unarmed transports and issued to KGzBV for the invasion of Norway. Six C-0 aircraft were fitted with defensive armament and bomb racks and delivered to I./KG 40 under the command of Major Edgar Petersen, formed to operate the aircraft. Operations began from Denmark, attacking British shipping. These ceased by June 1940 when the unit was withdrawn to re-equip with the improved Fw 200C-1.

Moving to Bordeaux-Mérignac under IV Fliegerkorps in August 1940, KG 40 would fly out

manded by *Obstlt* Harlinghausen and subordinate to Luftflotte 3 under Hugo Sperrle, this unit was headquartered at Lorient.

I./KG 40 was now a full three-Staffeln unit with a nominal strength of thirty-six Fw 200s. In reality, they rarely had more than eight aircraft serviceable at any one time. Stab and I./KG 40 were based at Bordeaux-Mérignac with a detachment in Trondheim, Norway. Twenty-six He 111s of III./KG 40 were also on strength. However, by late 1941, Condor operations were curtailed in view of the



type's increasing losses.

Increases in AA armament and CAM-equipped merchant ships had driven the Condors into a 'shadowing' role. The crew were instructed to return to base, if even slightly damaged, rather than risk their valuable aircraft.

By August 1941, KG 40 consisted of I./KG 40 with twenty-eight Fw 200C-3s, II./KG 40 with twenty-four Dornier Do 217E-2s, and III./KG 40 with twenty He 111H-6s. II./KG 40 was based at Soesterberg and operated under Fliegerkorps IX in the anti-shipping role over the North Sea. However, the use of these forces on bombing raids over England, in spite of protests from *Fliegerführer Atlantik*, reduced available aircraft alarmingly. Harlinghausen was wounded over Bristol in October and was not replaced.

By 1942, KG 40 was down to eighteen Fw 200s in I./KG 40, and eighteen He 111H-6s, of 8 and 9 Staffeln as 7./KG 40 was in the process of re-equipping with the Condor and was non-operational.

The unit was also used for aerial reconnaissance over the Arctic when Russian bound convoys were expected. On locating a convoy, the Condors would decide if attacks were to be made by U-Boats or bombers. If the former, the Condor would act as *Führungshalter* or contact machine, sending reports to *Befehlshaber der U-Boote*, no

contact between the actual boats being directed or the aircraft taking place.

Early in the operational life of the Condor, it was intended to be replaced by the Heinkel He 117. By early 1941, it was obvious that this would not happen anytime soon, and as a result, the demand for the Condor increased, yet only fifty-eight machines were built during the whole of 1941. Bomb damage to the Cottbus factory was one reason, the transfer of production to Blohm und Voss another. KG 40 sent crews to collect every aircraft as it came off the production line, even so, it barely kept pace with I./KG 40's demands.

"I./KG 40 was now a full three-Staffeln unit with a nominal strength of thirty-six Fw 200s..."

Although the re-equipping of III./KG 40 was considered a matter of urgency, only a few aircraft reached this Gruppe. Diversion of some machines to the *Reichskurierstaffel* didn't help matters.

At the beginning of 1942, the C-4 variant began to leave the factory. The C-2 versions were basically modified C-1s, whilst the C-4 was produced in greater numbers than any other and was the first to be fitted with search radar.

In early 1942, I./KG 40 was transferred to Trondheim-Vaernes to engage the Russian con-



voys to Murmansk. III./KG 40 continued to operate from Bordeaux-Mérignac. 9./KG 40 was transferred to Lecce in Southern Italy towards the end of 1942.

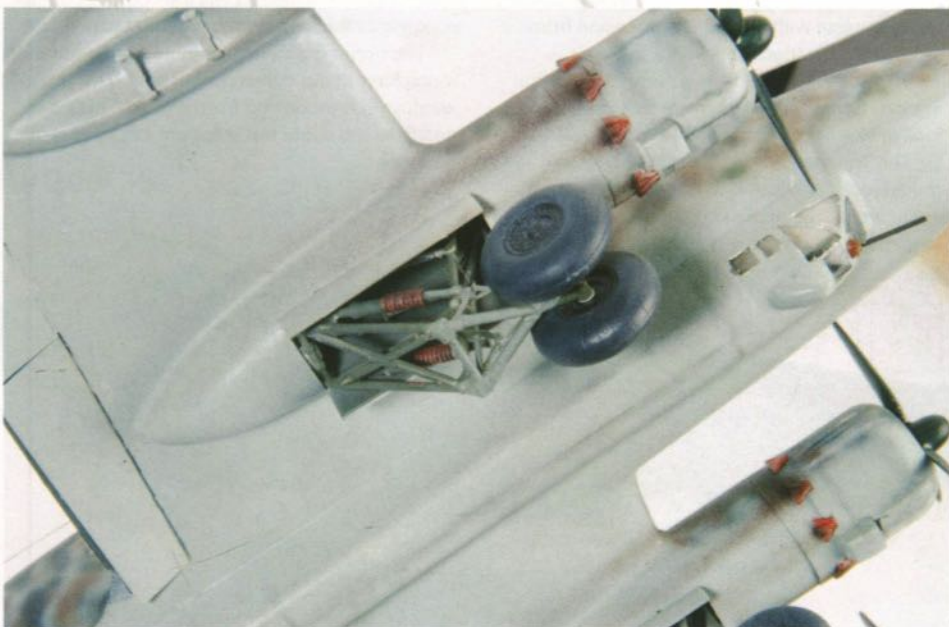
July saw the addition of some Ju 88C-6 heavy fighters to the strength of III./KG 40 although these were later concentrated, together with others, in the 13 staffel of V Gruppe.

Eighty-four Condors were produced in 1942, mainly C-3 and C-4 sub-types. Some were issued to 1.(F)/AfKlGr 120 and 1.(F)/AfKlGr 122 in Norway and Sardinia respectively, but the bulk went to KG 40.

Activity over the Atlantic dropped when most of KG 40's Condors were sent to Russia to help supply the trapped Sixth Army in Stalingrad. 2./KG 40 remained in France, whilst 1 and 3 Staffeln formed *Sonder-Unternehmung Stalingrad* or KGrzbV 200. With a mere eighteen aircraft, they flew supply and bombing missions until withdrawn in early 1943 when both units were combined to form 8./KG 40 at Berlin-Staaken. New 1 and 3/KG 40s were formed with the He 177 before being sent back to Bordeaux to resume the maritime role.

Throughout 1943 a mere seventy-six aircraft were built. Some were the latest C-8 series with lengthened outer engine nacelles able to carry the Hs 293A guided missile. Conversions of earlier sub-types to carry this weapon were designated as C-6. These were used by KG 40 for the first time on 28 December 1943, although this was unsuccessful as the Condor carrying the weapons was forced to ditch by an attacking Sunderland flying boat.

By 1944, the Condor's anti-shipping days were numbered. The loss of the French bases in the summer saw III./KG 40 transferred to Norway and the rest of the unit to Germany. In any event, patrolling Beaufighters and Mosquitos, and to a lesser extent Sunderlands and Liberators, forced the Condor crews away from the Biscay area, forcing detours as far south as Cape Ortegal in Portugal to avoid allied patrols.

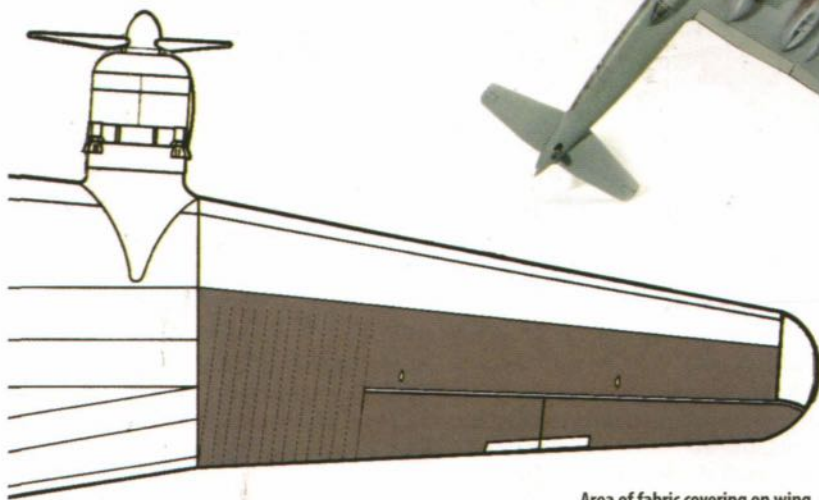




Kits of the Condor

As far as I am aware, only four models of the Condor have been produced, two by Revell in 1/72 scale, one (vacform) by Koster in 1/48 and one by Trumpeter, also in 1/48 scale.

From memory, the initial Revell release was way back in the late 1960s. I built one as a lad and

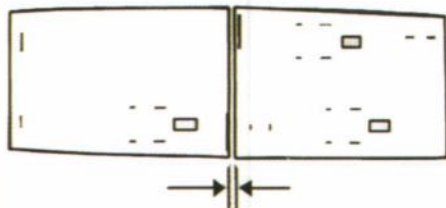
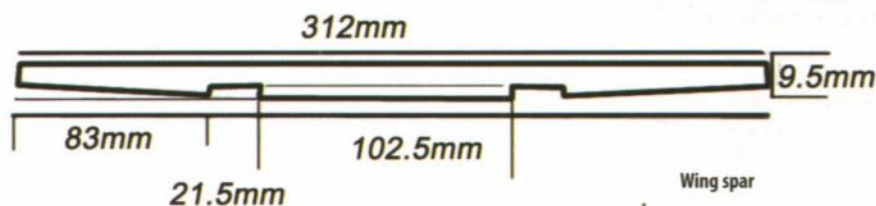


Condors normally flew in formation at sea level for mutual protection. Supported in early 1944 by He 177s and Ju 290s, Condors were solely concerned with shipping attacks. A typical mission would involve four machines sent out when a definite target was in the area. Flying parallel courses with a 25 to 30 mile separation, the Condors would search at sea level, every now and again climbing to 1,500 feet to search with the *Hohenzweil* radar. Low level attacks were forbidden, a minimum altitude of 9,000 feet being specified.

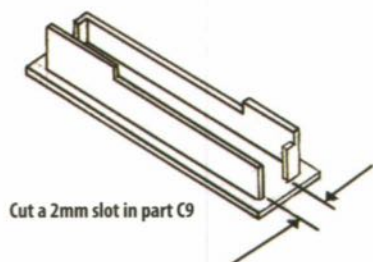
From Norway, the aircraft only flew reconnaissance missions, the normal daily effort being one aircraft.

As originally conceived, the Fw 200 would have been a world beating commercial transport. Forced into a totally different role upon the outbreak of war, the lack of allied air opposition gave the Condor a chance to shine in its new role, which until the end of 1942, it did. It achieved success out of all proportion to the numbers involved and for a while, deserved the reputation of 'Scourge of the Atlantic'.

"By the end of March 1941, Condors of KG 40 had accounted for some 363,000 tons of shipping..."



Remove 2mm from floor part E11



Cut a 2mm slot in part C9

it certainly looked like a Condor – to me at least. Later, building another for a Battle of Britain display, I applied my improved (*sic!*) modelling skills to the kit, sanding away the masses of rivets and raised panel lines – all of which were then rescribed where necessary. I also modified it into an early C-0 sub-type by scratchbuilding the forward dorsal machine gun position.

More recently, Revell have released a retooled C-8, complete with Hs 293 weapons and from reports, it's the 'bees knees'.

The Koster 1/48 kit is a vacform, with all that implies. Some modellers make vacform building look easy – although it's not my bag, I'm afraid.

The Trumpeter 1/48 scale kit is injection moulded. However, it is a little disappointing in some areas. The provision of the internal long range tanks, together with certain other interior

items is, in my view, a bit of a waste, as they cannot be seen once the model is finished. It might have been better had Trumpeter supplied alternative outer engine nacelles and Hs 293 glider bombs to produce a later version.

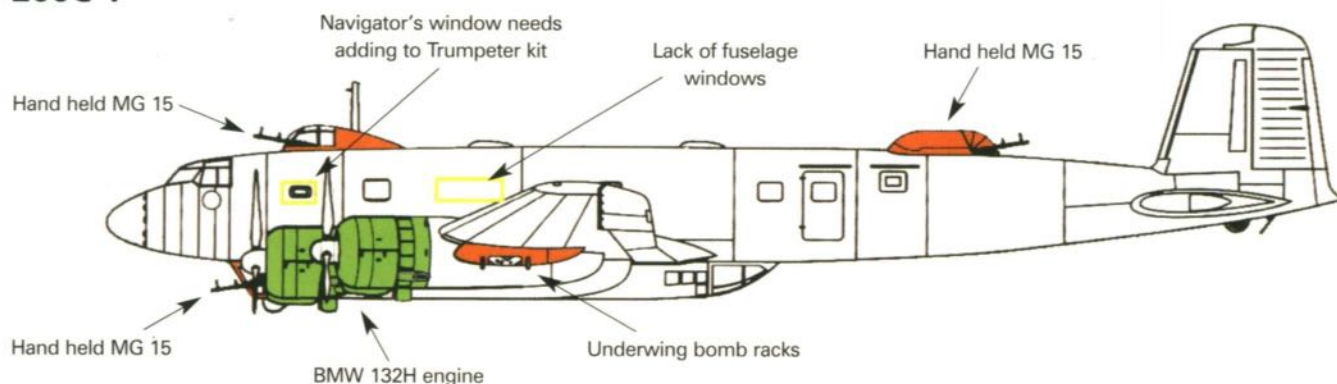
There are no etched parts in the kit, so modellers will have to add aftermarket seat belts in the cockpit or make their own. The pilot's side console will need to be added as will the compass on the coaming at the top of the instrument panel.

The upper gunners' positions can be left until much later in the construction, but check the side window fit if modelling from a photo, they are nearly all the same but there are occasional differences.

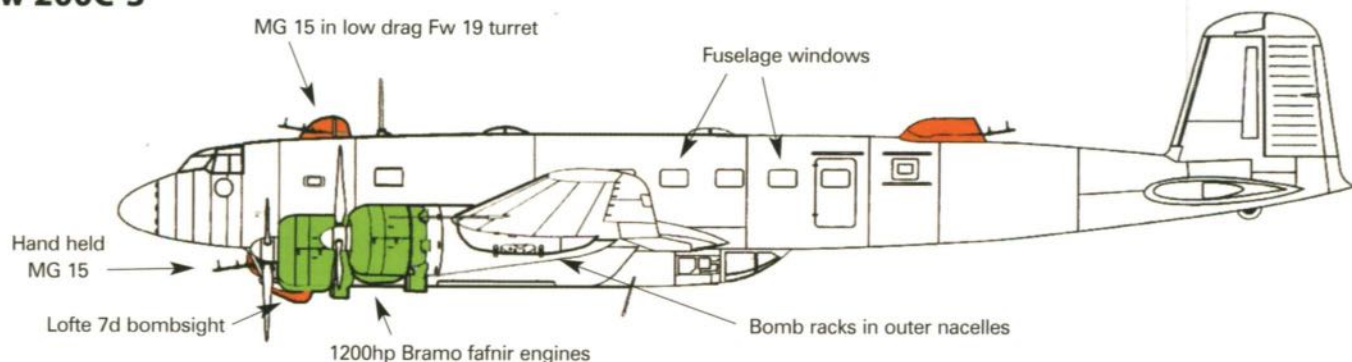


Focke Wulf Fw 200 Condor sub-type guide

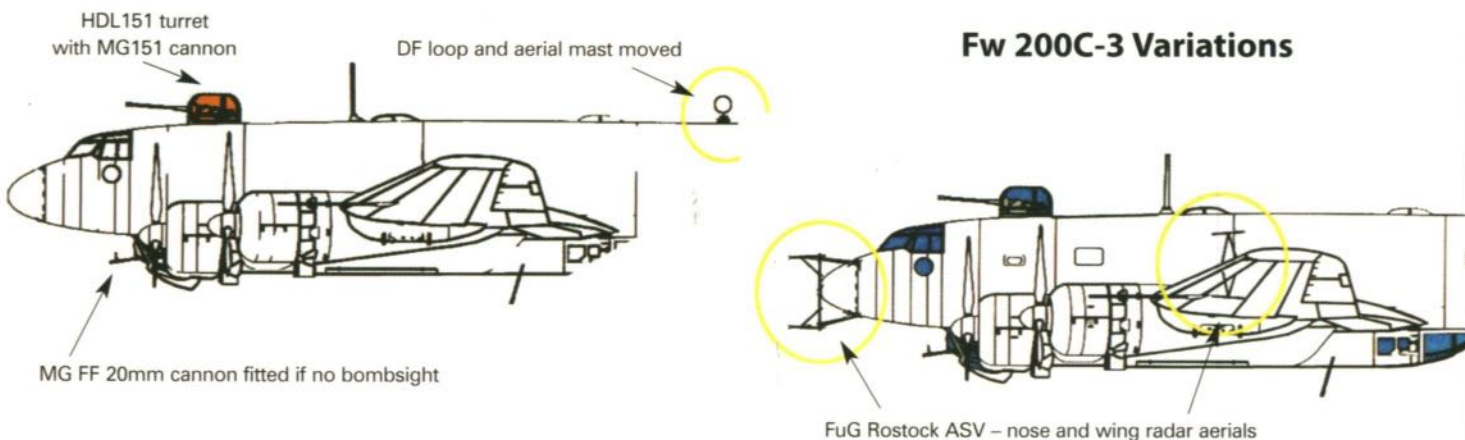
Fw 200C-1



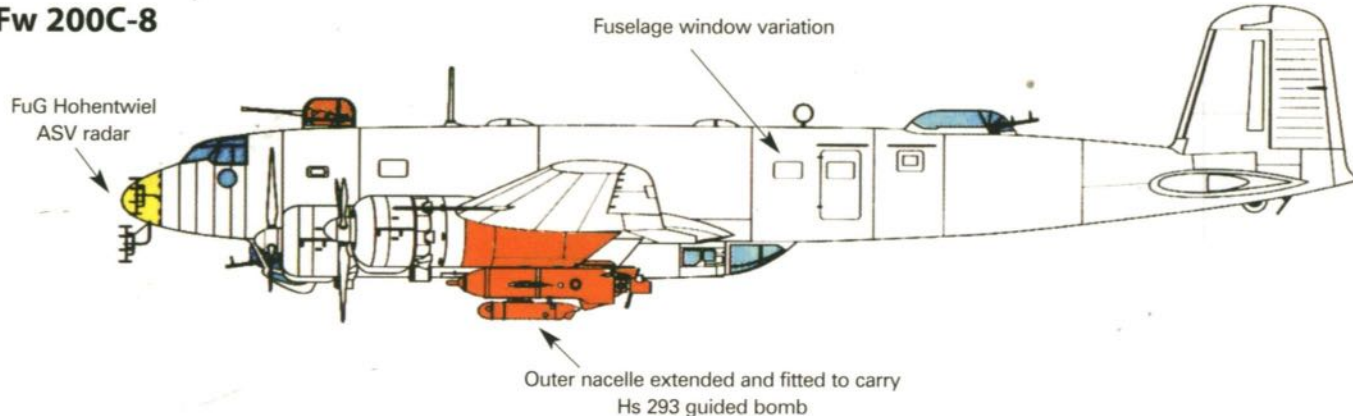
Fw 200C-3

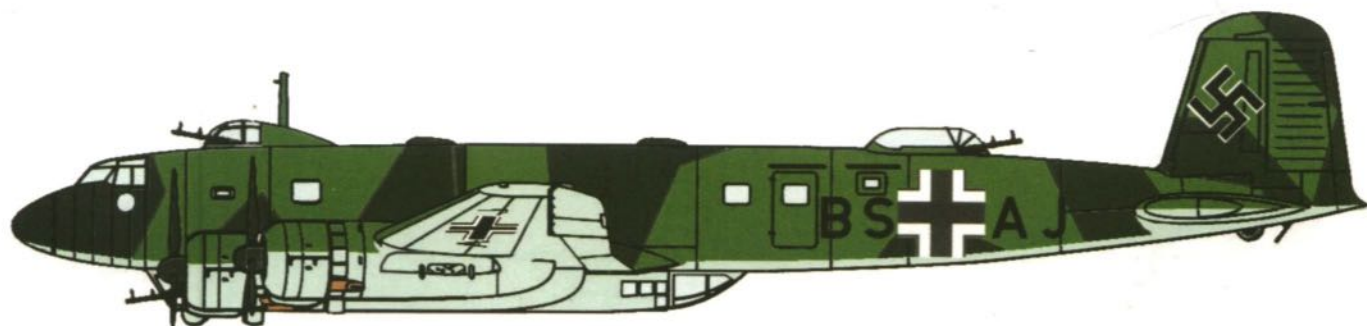


Fw 200C-3 Variations



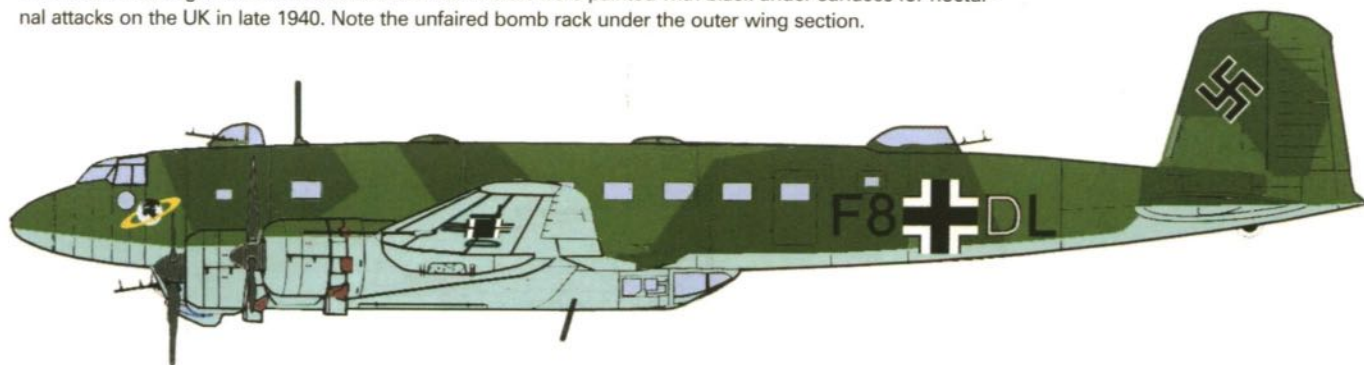
Fw 200C-8





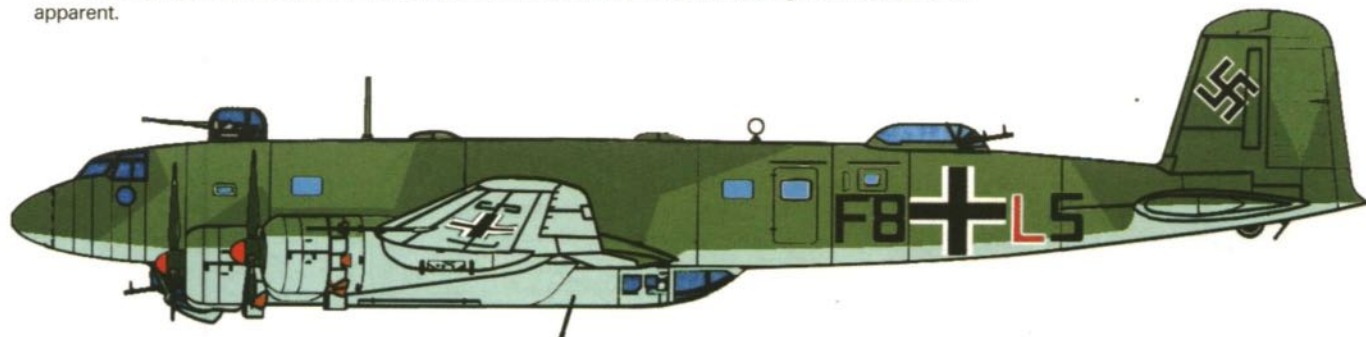
Focke Wulf Fw 200C-1, BS+AJ, of 1.KG 40, circa 1940

Finished in RLM 70 and 71 upper surfaces with RLM 65 under surfaces, BS+AJ was the fifth C-1, built at Bremen. Factory codes were still in evidence at this time but were eventually replaced by F8+KH codes. KG 40's 'world in a ring' was also added at this time. Aircraft were painted with black under surfaces for nocturnal attacks on the UK in late 1940. Note the unfaired bomb rack under the outer wing section.



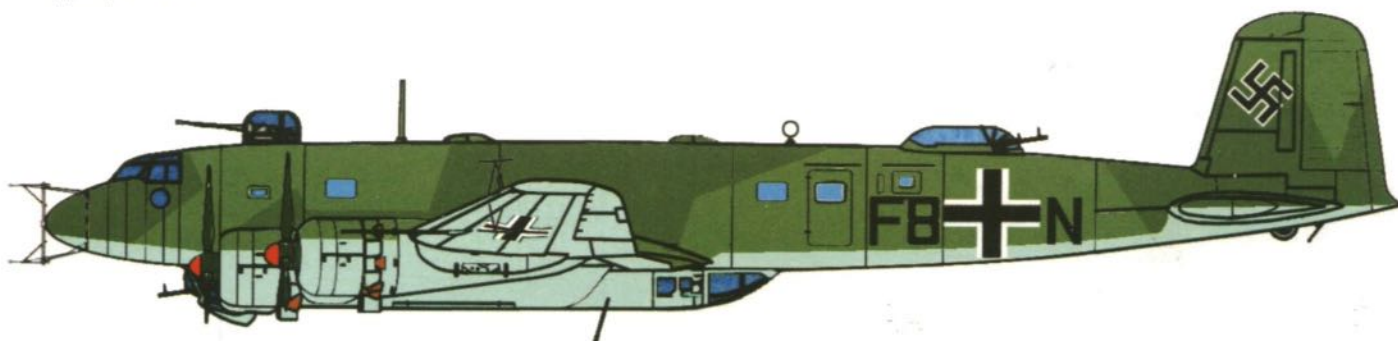
Focke Wulf Fw 200C-3, F8+DL, of 3.KG 40, circa 1941

Finished in RLM 72 and 73 'maritime greens' upper surfaces with RLM 65 under surfaces. In addition to the new front Fw 19 turret, the outer wing section bomb rack has been faired in to the wing proper. Engines are now BMW Bramo Fafnir 323R-2 radials with ejector exhaust manifolds. Extra fuselage windows are also apparent.



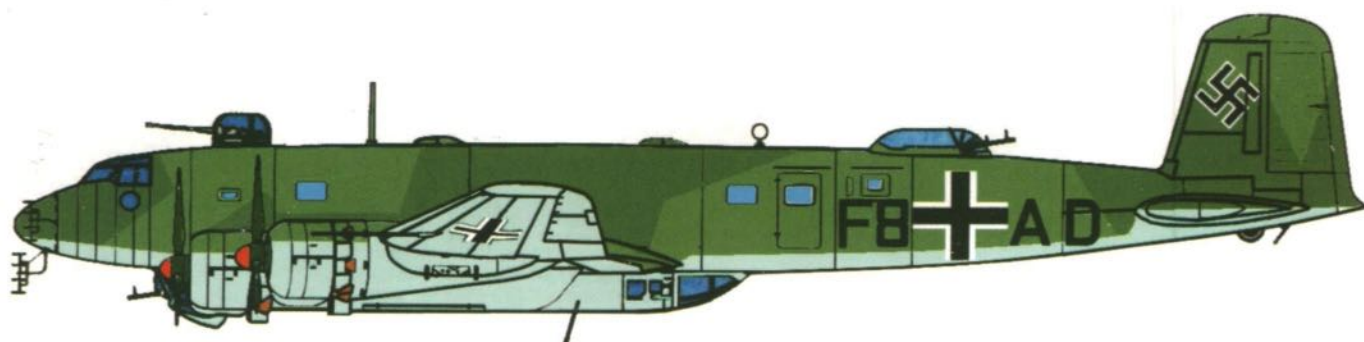
Focke Wulf Fw 200C-4, F8+LS, of III./KG 40, 1942

Finished in RLM 72 and 73 'maritime greens' upper surfaces with RLM 65 under surfaces. The new HDL front turret with a 20mm cannon is the obvious difference, although some C-4s had the Fw 19 turret in both upper positions.



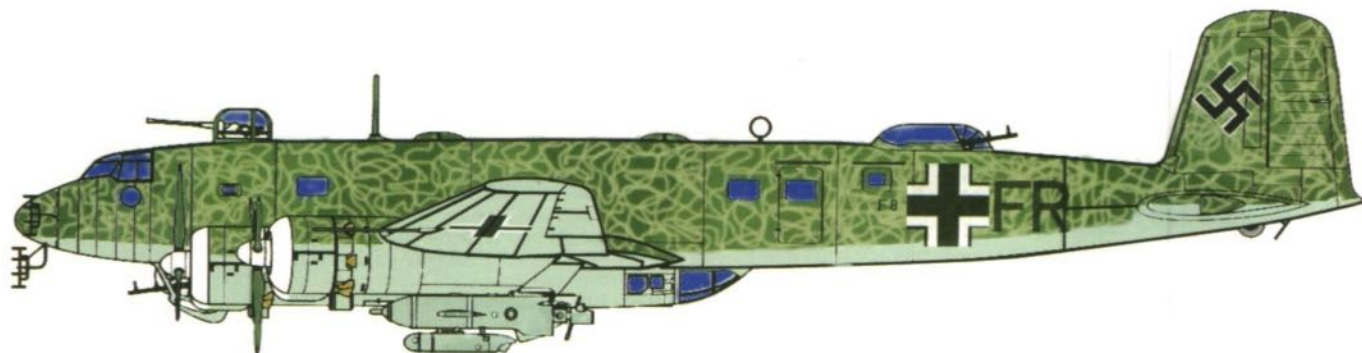
Focke Wulf Fw 200C-4, F8+N, of III./KG 40, 1943

Finished in RLM 72 and 73 'maritime greens' upper surfaces with RLM 65 under surfaces. This is one of the few C-4s equipped with the FuG Rostock ASV radar. Note the wing aerial fit.



Focke Wulf Fw 200C-4, F8+AD, of Stab III./KG 40, 1943

Finished in RLM 72 and 73 'maritime greens' upper surfaces with RLM 65 under surfaces. This C-4 was equipped with the more common FuG Hohentwiel ASV radar.



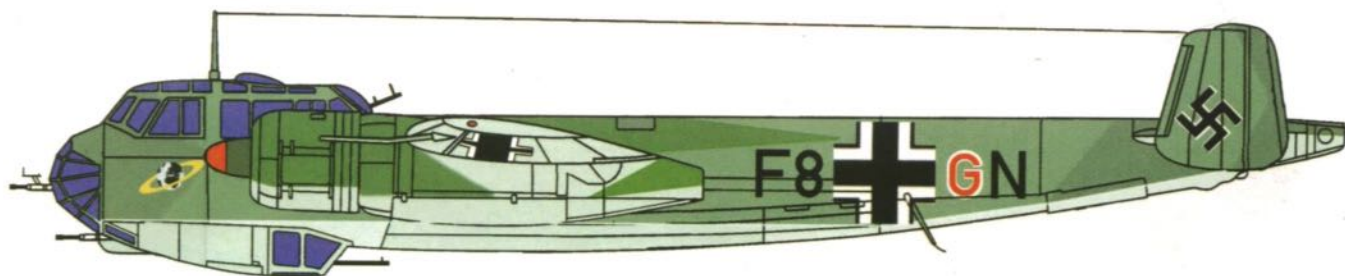
Focke Wulf Fw 200C-8, F8+FR, of 7./KG 40, May 1944

Finished in RLM 72 and 73 'maritime greens' upper surfaces with RLM 65 under surfaces. The wave mirror 'squiggle' pattern colour is speculative and illustrated here as RLM 02 Grau. Note the extended outer engine nacells and Henschel Hs 293 glider bomb.



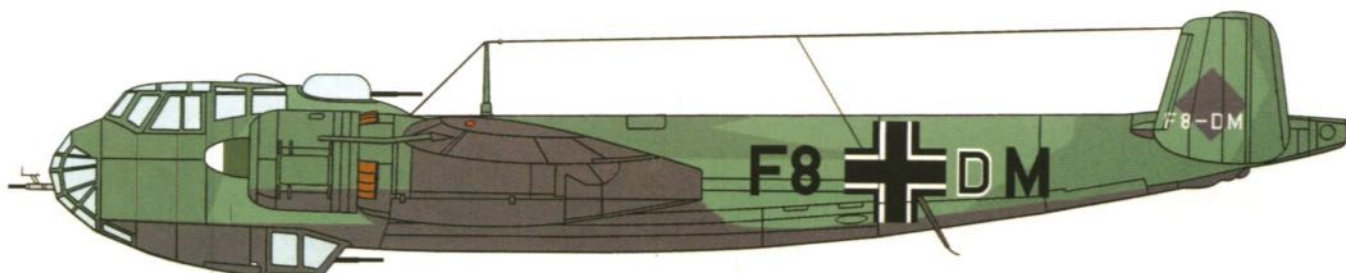
Typical Focke Wulf Fw 200 upper surface camouflage pattern

As the RLM 72 and RLM 73 'maritime greens' are very similar in tone and are hard to distinguish, these illustrations have had the 'colours' altered slightly to better show the pattern demarcation.



Dornier Do 217E-1, F8 + GN of II./KG 40, Cognac, 1941

Finished in RLM 72 and 73 'maritime greens' upper surfaces with RLM 65 under surfaces. This unit was involved in anti-shipping duties for a couple of months before being transferred to Soesterberg for 'normal' bombing duties.



Dornier Do 217E-4, F8 + DM of 4./KG 40, Soesterberg, 1942

Finished in RLM 72 and 73 'maritime greens' upper surfaces with temporary black under surfaces for night bombing missions over the UK. Note the painted-out swastika and modified fuselage cross with reduced white areas. The MG FF gun under the nose has also been removed.

Support for the fuselage half join is needed. I used pieces of plastic card strategically positioned around the join, as well as around the wing root. This was also a good time to cut out the navigator's window, (shown as a small raised square on the port fuselage), and create another round window on the starboard fuselage.

Turning to the wings, support in the form of a spar of some description is literally mandatory. The plastic is so flexible that the fuselage-wing join will not bear the strain. The spar, (designed by a member of IPMS Philippines), is shown in one of the accompanying drawings together with how to mount it. I used this method and it worked a treat.

The mainwheel bays are devoid of detail, but as I work on the 'pick my model up and die' syndrome, I therefore ignored this area! The top and bottom of the outer wing panels need all the rivet indentations filling in. This area was fabric covered on the

ly attached to the elevator tips.

I carefully removed the two teardrop-shaped 'pips' from either side of the rudder and saved them. I then sanded down the rib/fabric effect here as well, and reattached two of the saved 'pips' to their positions on the port side of the rudder. There were none on the starboard side.

After the fuselage halves had been joined and the glue allowed to cure completely, I added the wings, adjusting them as necessary to match the spar. Just a little filler on the actual root joint was necessary.

The engines were then assembled, drilling the cooling vent in each propeller boss before fitting. The exhaust manifolds are semi-circular and fit well, and adequately give the impression of pipes. The undercarriage struts needed some cleaning-up of the mould lines but assembled into a reasonably sturdy affair – which is more than can be said of the real thing!

The rest of the con-

struction is otherwise relatively straightforward.

For painting, I used Hannant's Xtracrylix paints, XA1208 for the RLM 76 under surfaces and XA1222 and 1223 for the RLM 72 and 73 uppers.

I normally give my models a coat of Halfords auto acrylic varnish before applying the decals, but I have found that Xtracrylix does not like this and crinkles, so I now apply a thin coat of Johnsons Klear/Future floor polish first before the varnish to seal in the acrylic paint.

The decals supplied in the kit are, to say the least, appalling! In the end, I used the swastika and underwing crosses from the kit, the rest came from my spares box. As far as I am aware, no-one has yet seen fit to supply us with any aftermarket sets for this kit – unless I missed them? At the very least, some aftermarket etched brass radar aerials would not come amiss...

The finished model is one large beast, so you'll need a LARGE box to store it in – unless you have model shelves the size of an aircraft carrier's flight deck! **MAM**

real aircraft. I used Mr Surfacer for this. Also, the extra large ribs were sanded away as they are barely visible on the real aeroplane.

I also sanded away most of the ribbing on the elevators and ailerons as this is far too overdone. Whilst I was at it, I cut away the wrongly-positioned triangular balance from the tailplane. This was then recreated in thin plastic card and correct-



Showtime

Monthly update on aviation and related events near and far...



2009

diary

JANUARY

Sunday 11 January 2009 Bolton IPMS Model Bonanza

Bolton IPMS are proud to announce their 9th Annual model show to be held at St Joseph's RC High School, Chorley New Road, Horwich near Bolton, (BL6 6HW). Free parking, Trade Stands, 'Make & Take', Club Displays, Open Competition and new for 2009 – Modellers Clinic! Theme for the show is 'Stripes'. For further details David Swift (01204) 695375, email ipms.bolton@btopenworld.com



16 to 18 January 2009

London Model Engineering Ex. 2009

Alexandra Palace, London
With over a thousand models on display and over 90 companies participating, the show is a 'must' for all modellers generally. The 1,000 plus exhibits cover every aspect of traditional through to modern modelling, with steam locomotives, stationery engines, workshop tools and equipment, boats, through to remote control aeroplanes, miniature rockets, model road vehicles, AFVs and hovercraft

FEBRUARY

Saturday 14 February 2009

The Fleet Air Arm Museum Model Show

at the FAA Museum near Yeovilton, Somerset. The largest event of its kind in the South West – over 2000 visitors expected, over 120 traders and clubs. Airfix will run a 'Make and Paint' workshop and sponsor several

competitions. Weather permitting, the highlight of the Show will be a flying display by the award winning BMFA (British Model Flying Association). Doors open at 10.00am and normal Museum admission prices apply

Saturday 14/Sunday 15 March 2009 The Southern Expo Model Show

will be held at the Hornchurch Sports Centre, Harrow Lodge Park, Hornchurch Road, Hornchurch, Essex, RM11 1ET. Open from 10am to 5pm Saturday and 10am to 4pm Sunday. Contact Peter Bagshaw, Southern Expo show organiser for further details email southernexpo@tiscali.co.uk

Sunday 15 February 2009 Huddersfield 2009

to be held at the Huddersfield Sports Centre, Southgate, Huddersfield. HD1 1TW. Hosted by IPMS Wakefield. Doors open 10.00am – 5.00pm. Admission: £3.00 and £1.00 concessions. Contact Alan Paul (07811) 358355 or Andy Scholefield (07775) 641315

Sunday 22 February 2009

The South Cheshire Militaire

at the Oakley Centre, Crewe. Features club stands, traders and our famous Open Competition plus, of course, something a little different as always! 10am to 5pm, adults £3.50, children and OAPs, £1.50. For more details www.southcheshiremilitaire.co.uk, email show@southcheshiremilitaire.co.uk or phone Phil on 01270 256880 (clubs) or Steve on 07914 763626 (traders)

Saturday 28 February 2009

Newark Air Museum

Indoor Aeroboot Table Top Sale. 9.00 to 16.00 hours. Browse through a varied selection of aviation items amongst the aircraft in Hangar 2, up to 35 stalls expected. Admission £4.00. Anyone interested in selling goods is asked to email in for details via the museum website www.newarkairmuseum.org or telephone 01636 707170

MARCH

Saturday 7 March 2009

North Somerset Model Show

organised by IPMS North Somerset/North Somerset Modellers' Society, present their 14th annual model show at the Locking Castle

Campus, Weston-super-Mare, BS24 7DX. Open from 10am to 5pm. Club displays, traders and an open model competition. Admission £2.00 adults; £1.00 children; £1.50 concessions. Free parking. Traders contact Darren Poyser on 01934 516756. Clubs contact Jerry Mills on 01934 520593 email www.finetooth-systems.com/IPMSNorthSomerset/

Saturday 14th/Sunday 15 March 2009 The Southern Expo Model Show

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20 to 23 March 2009

IPMS South Africa National Champs

at Air Force Base Swartkops near Pretoria, home of the SAAF Museum. The championships will be held in the museum hangers amongst the exhibits. For entry details log on to ipmspta.co.za/nats2009 or via our national site ipmssa.org.za. Colin Burgess IPMS SA National Chairman

Saturday 28 March 2009

Replicon XXIV

Freeport Recreation Center, Freeport New York, USA. 9.00am until 4.00pm. The contest will include over forty categories, plus best Long Island subject and best 1969 subject. Also there will be 'Best Of' awards for aircraft, armor, ships, automotive, figures, sci-fi, and a 'Tail Hook' award for best naval aviation subject. Contact Robert DeMaio email taurleo@optonline.net, LISMS website www.lisms.org

APRIL

Saturday 4 April 2009

MOSQUITOCON 2009

Presented by New Jersey IPMS at the Wayne Police Athletic Hall (PAL), Wayne, New Jersey, just off of Rt.23, which is just off of Rt 80. Theme this year is 'Between the Wars 1919-1939'. In addition to the model competition the show features a 'Make 'n Take' Junior modeling seminar. Contact Big Bill Schwarz 732-567-3724 (no calls after

9pm) or email tomcatter53@optimum.net. Website www.njipms.org for updates, including on-line features for registration forms and news

Sunday 5 April 2009

Shropshire Model Show

held at the RAF Museum Cosford, Shropshire, 10.00am to 4.00pm. Free entry, 40+ trade stands; 70+ club displays; Open Competition For further info contact Gary Stevens (01939) 270481 or email gary473@btinternet.com

Saturday 11 April 2009

Day-Night Photo Shoot

at Newark Air Museum. The event will commence after the museum closes at 5pm. The event will feature themed ground equipment; uniformed personnel; and illuminated aircraft. The aircraft being featured for this first event will include: Vulcan, Shackleton, T-33, Sea Vixen, MiG-23 & Buccaneer. Admission costs £20 per person and places will be limited to 30 people. Anyone interested is asked to email in for details via the museum website www.newarkairmuseum.org or telephone 01636 707170

Saturday/Sunday 18/19 April 2009

The South West Model Engineering, Model Making and Hobbies exhibition

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Tornado F.3 ZE159/UV in the 2002 111 Squadron 85th Anniversary markings is seen in flight carrying an inert ASRAAM AAM on each wing pylon station and with ALE-40 launchers visible under the rear fuselage. Although the aircraft has dark blue/red national markings it is painted in the light greys colour scheme. (Courtesy of RAF Leuchars Photo Section)

SCALED UP

Attack and Protect

RAF Leuchars' Tornado F.3 Wing

Following last month's coverage of No.56 Squadron's Tornados, Des Brennan now takes a photographic look at the current operational Tornado F.3 fleet

RAF Leuchars near St Andrews in Fife, Scotland is the home to the Royal Air Force's final two operational Panavia Tornado F.3 squadrons and will remain so until the type is replaced in service by the Eurofighter Typhoon.

This process is expected to start in September 2010 when the first of three Typhoon squadrons, possibly No.6 Sqn, will locate to Leuchars with the Tornado F.3 being withdrawn about 6 months later. From comments made by the Station Commander and reported in the local press during August 2008, the Typhoon is expected to operate from Leuchars until at least 2050.

There is a history of military aviation in the area going back almost a century to the use of balloons by the Royal Engineers in the adjacent Tentsmuir Forest. Military development on the Leuchars' site itself began in 1916 with the training of aircrew as gunnery spotters for the Royal



Tornado F.3 ZE342/HW from 111 Squadron seen at RAF Leuchars in September 1994, shows the style of markings originally worn after conversion from the Phantom

Navy and carried on after that war. In 1935 a more general training role came with No.1 Flying Training School but with the inevitability of another war looming the station, and its role, transferred to Coastal Command in 1938. This remained the case until 1950 and a move to Fighter Command. Since then Leuchars has been home to the Meteor, Vampire, Javelin, Lightning, Phantom and Tornado F.3. In both offensive and defensive roles RAF Leuchars has lived up to the station motto of 'Attack and Protect'.

Today Leuchars is home to No.43 and No.111 (Fighter) Squadrons, both flying the Tornado F.3, and supports the similarly equipped No.1435 Flight operating from RAF Mount Pleasant in the Falkland Islands until it converts to the Typhoon in the autumn (Northern Hemisphere) of 2009.

Also based at Leuchars are the East of Scotland University Air Squadron (ESUAS) flying the Grob Tutor T.1 and, until it disbands in spring 2009, 3 Flight Army Air Corps (Volunteer) flying the Gazelle AH.1.

The Leuchars Tornado F.3 Wing was the last to form on the type, converting from the Phantom in 1989, (No.43 (F) Squadron), and 1990, (No.111 (F) Squadron). With the Iraqi invasion of Kuwait later that year many of the base's factory-fresh latest-modification aircraft were temporarily lost as they were rotated through other units for service in the Gulf, but Leuchars' crews were amongst those who subsequently took them to war, as they have done so again and again over the Balkans and Iraq in the years that have followed.



Tornado F.3T ZE296/GR from 43 Squadron seen at RAF Leuchars in September 1996, shows the original style of markings applied after the unit had re-equipped on the type



The fin of 111 Squadron Tornado F.3 ZE907/XH photographed in the Tornado Servicing Flight Hangar at an RAF Lossiemouth open day in June, 2003 shows signs of previous 111 Squadron ownership on the fin cap as well as the much smaller squadron crest worn by some aircraft after the 2003 Gulf War



43 Squadron Tornado F.3 ZE790/GD seen at Leuchars on 29 July 1998 wears the least colourful form of squadron markings with reduced size codes and 'Fighting Cock' high up on the fin. This aircraft was one of a flight of four, each armed with a live Skyflash AAM, holding off on the runway



111 Squadron Tornado F.3 ZE341/J photographed from the old control tower at Leuchars on 30th. June, 1999 during a CQWI Course wears the darkest form of markings carried by any F.3 unit in the form of a black band across the fin cap incorporating a stencil of the squadron crest and code letter; the outline of the previous markings can still be seen



43 Squadron Tornado F.3 ZG798/GQ engages reheat to take off from Leuchars on 27 June 2007. Aircraft is carrying a RAIDS pod on the outer launch rail and wears the current style of fin checks with 'Fighting Cocks' logo, the unit badge below has completely peeled off to give a rather effective 'low-viz' effect



43 Squadron Tornado F.3 ZE158/GA with the current style of fin checks and 'Fighting Cocks' logo turns back from the runway at Leuchars during a CQWIC sortie on 24 November 2004. The aircraft is carrying 495 gallon/2250 litre droptanks and has an inert AIM-9 Sidewinder AAM on the outer launch rail. It can also be seen that many panels on the fuselage have been replaced/repainted in a lighter shade of grey



43 Squadron Tornado F.3 ZE810/GG quits the runway after landing at Leuchars on 18 July 2007 with the wings fully swept back, a common practice for the F.3 and possible because of its greater length and different centre of gravity from other Tornado variants. The aircraft is wearing the current style of markings and carries an inert ASRAAM AAM on the outer launch rail



43 Squadron Tornado F.3 ZE255/GC leaves the shorter cross runway at Leuchars on 18 July 2007 wearing the current style of markings and with flaps and spoilers deployed, tailerons forward and reverse thrust buckets open. The aircraft carries an inert ASRAAM AAM on the outer launch rail



Medium Sea Grey fin on the otherwise lighter grey coloured 43 Squadron Tornado F.3 ZE831/GN seen at Leuchars on 12 September 2008 when returning from a TLP Course in Belgium, the aircraft is wearing the current style of markings with the exception of the unidentified 'zap' on the head of the 'Fighting Cock'



111 Squadron Tornado F.3 ZE791/HF being prepared for a CQWIC sortie at RAF Kinloss on 26 June 2008. The aircraft is in the overall medium grey colour scheme but with a white fin code and carries a RAIDS pod on the outer launch rail



43 Squadron Tornado F.3 ZE831/GN painted in the lighter grey colour scheme but with a Medium Sea Grey tail returns to Leuchars on 12 September 2008, after participating in a TLP Course at Florrenes in Belgium. Aircraft is in the current style of markings and carries 330 gallon/1500 litre drop tanks as well as an inert ASRAAM AAM on the outer launch rail



111 Squadron Tornado F.3 ZE162/HM at RAF Leuchars on 12 September 2008 displays the current style of markings as well as the black codes and darker national markings of the overall medium grey colour scheme. The outer wing pylons had been activated on this aircraft which carried a Phimat dispenser to starboard (as seen) and Boz-107 to port



Overall medium grey Tornado F.3 ZE788/HV from 111 Squadron wearing RAF 90th Anniversary markings returns to Leuchars from a TLP Course in Belgium on 12 September, 2008. The aircraft also carries 'fighter bars' on either side of the national insignia and as seen on some other Tornado F.3 carries its construction number behind the ram air intake on the fin



Rear quarter view of 43 Squadron 90th Anniversary scheme Tornado F.3 ZG757 turning from the short runway into the squadron HAS site at Leuchars on 18 July 2007 with wings swept and showing the inert ASRAAM AAM on the outer and BOL dispenser/launch rail mounted on the outer and inner faces of the wing pylon as well as the ALE-40 launchers mounted under the rear fuselage



A line up of 111 Squadron Tornado F.3 at Kinloss on 26 June 2008 during a CQWI Course displaying a diversity of styles and colours in fin marking, serial and codes



Close-up of the starboard tail area of overall medium grey Tornado F.3 ZE788/HV from 111 Squadron wearing RAF 90th Anniversary markings at RAF Kinloss on 26 June 2008 for a CQWI Course. The carrier film and some damage to the anniversary markings can be seen as can the aircraft construction number behind the fin ram air intake



Close-up of the fin area of 43 Squadron flagship Tornado F.3 ZE887/GF as it returned to Leuchars on 12 September 2008 from a TLP Course at Florrenes in Belgium. The fin has been 'zapped' with several sets of 'Junior Pilot's Wings' as well as what looks like a 43 Squadron sticker on the leading white check



43 Squadron flagship Tornado F.3 ZE887/GF receiving attention from ground crew after returning to Leuchars on 12 September 2008 from a TLP Course in Belgium. The aircraft is carrying 330 gallon/1500 litre drop tanks, an inert ASRAAM AAM on the port and RAIDS pod on the starboard outer launch rails and BOL dispenser/launch rails inward on both



Close-up of the cockpit area of 43 Squadron flagship Tornado F.3 ZE887/GF as it returned to Leuchars on 12 September 2008 from a TLP Course at Florrenes in Belgium carrying a third crew member; crew names are different from the similarly marked ZG757 and the rear-seater has been awarded a set of 'Junior Pilot's Wings'

The wing was joined in the 1990s by the Operational Conversion Unit (OCU), No.56 (Reserve) Squadron, which subsequently disbanded in April, 2008 as part of the F.3 drawdown and whose duties have been taken over by a Tornado F.3 Training Flight within an expanded No.43(F) Squadron – see last month's 'Scaled Up'.

This move saw No.43 Squadron vacating the Hardened Aircraft Shelter (HAS) site it had used since its days on the Phantom and moving to line and hangar based operations from the former No.56 Squadron accommodation. Whilst No.111 Squadron still operates from its HAS site it has also initiated a less manpower intensive 'mini ramp' within the site from which to turn around aircraft during daily operations.

The Panavia Tornado F.3

Although possessing a self-defence capacity, the multi-national Panavia Tornado GR/IDS (Interdictor-Strike) with its air-to-ground operation optimised radar, was neither well suited nor properly equipped for the full air defence mission. Additionally, the needs of the European partners with their shared land borders with the Warsaw Pact and potential tactical fighter threat were completely different from long-range bombers imagined by the UK.

It was not surprising then that only the UK saw the potential for developing a Tornado ADV (Air-defence Variant) and subsequently became the main operator of the type which was also bought by Saudi Arabia, ordered but cancelled by Oman and rather ironically leased by one of the original Panavia partners Italy as a 'stop-gap' between the F-104S and the Eurofighter, although like all things Typhoon, that lease later expired and F-16s were acquired to fill the continuing gap.

In simple terms, the UK took the IDS/GR.1, extended the fuselage behind the cockpit for another fuel tank, fitted a new air-to-air optimised radar with different radome and cockpit instrumentation, deleted one cannon and added an internal air-to-air (AAR) refuelling probe on the opposite side from that bolted externally to the bomber variants, deleted the forward-facing radar warning (RWR) equipment from the tail and re-located it in the wingroot 'nibs', installed launch facilities for missiles below the fuselage and created the ADV variant.

Because the transformation from IDS to ADV involved major structural and equipment redesigns rather than merely the doctrinal adjustments involved in a role change from attack to air defence, the project was not without problems. Development was rather protracted requiring the Lightning to remain in service for longer than

planned and the airframe was ready for service before some major systems such as the Foxhunter radar and the improved RB 199 Mk 104 reheated turbofan engine.

The response was to release the Tornado F.2, powered by the RB 199 Mk 103 of the bomber variant and initially with ballast replacing the radar so creating the nickname 'Blue Circle Fighter', (after a well known brand of British cement), being applied to the aircraft by some. Several sources suggest that the ballast was in fact steel but accuracy rarely gets in the way of a good insult. The aircraft entered initial service with the OCU as the Tornado F.2 in 1984, being replaced by the full-production F.3 by 1986 and was in frontline squadron service by 1987.

On entering service the aircraft could carry four BAe Skyflash radar-guided air-to-air missiles (AAM) below the fuselage with the forward pair being semi-recessed and four AIM-9 Sidewinder infra-red AAMs carried one on either side of both

"The Leuchars Tornado F.3 Wing was the last to form on the type, converting from the Phantom in 1989..."

inner wing pylons. These have been replaced by the Advanced Medium-Range Air-to-Air Missile (AMRAAM) and Advanced Short-Range Air-to-Air Missile (ASRAAM) respectively and as mentioned, the aircraft carries one 27mm Mauser Cannon in the forward starboard fuselage.

The Tornado F.2 could carry 330 gallon (1,500 litre) drop tanks, as carried by the IDS/GR.1 variants, on the inner wing pylons whereas the F.3 was able to carry the larger 495 gallon (2,250 litre) drop tanks but in the lead-up to the 1991 Gulf War it became increasingly common to see either type of tank carried by both fighter and bomber variants. The larger tanks gave Tornado bombers greater unrefuelled range on low, fast and relatively level missions whilst the smaller tanks allowed the fighters increased manoeuvrability before having to jettison them.

The 1991 Gulf War campaign also saw the introduction of externally carried chaff/flare countermeasures to the Tornado F.3 which have evolved and increased during subsequent operations. This began with the fitting of AN/ALE-40 dispensers under the rear fuselage of the aircraft and the carriage of Phimat dispenser pods on an inner wing pylon Sidewinder rail. Later developments included activating the outer wing pylon mechanisms and the carriage of a Boz 107 Dispenser Pod or similarly shaped Towed Radar Decoy (TRD) Pod on one and a Phimat on the other. The missile launch rail lost earlier for the carriage of Phimat was later regained by the use of the BOL launch rail with integral countermeasures dispenser car-

ried on the inner face of the pylon.

In normal peacetime squadron operations a typical training load would be an inert ASRAAM (replacing the earlier AIM-9L Sidewinder) on the port outer and a Rangeless Airborne Instrumented De-Briefing System (RAIDS) pod on the starboard outer missile launch rails and BOL dispensers/launch rails on both inner stations with drop tanks, either 330 or 495 Gallon, are carried as required. AMRAAM, like Skyflash before it, is rarely carried during routine training. On Quick Reaction Alert (QRA) missions the 27mm Mauser cannon in the forward starboard fuselage is loaded, a full load of four each of live AMRAAM and ASRAAM (or previously Skyflash and Sidewinder) is carried and the larger 495 Gallon droptanks are fitted.

Such improvements in offensive and defensive stores, as well as the less obvious internal improvements to the Foxhunter radar, Night Vision Goggle (NVG) compatible cockpit instrumentation,

battle management systems, such as the JTIDS data transfer system, as well as generally updated avionics and navigation suites mean that the Tornado F.3 is a far different and more capable aircraft as it approaches the end of its service than it was when new.

The F.3 and Air Defence

All too often the Tornado F.3 is defined by what it is 'not', rather than what it 'is'. It is not a 'dogfighter', in fact it is not a 'proper' fighter in the same sense as say, the Lightning was, or an F-16 or an MiG-29 etc, etc. The effectiveness of any combat aircraft must come as much from the skill of those flying and fighting it as from the way it has been designed and built.

The Tornado F.3 was intended to meet a perceived Soviet bomber threat out over the North Atlantic in the Greenland-Iceland-UK (GIUK) Gap, day and night in all weathers, engaging the target beyond visual range (BVR) with radar guided Sky flash missiles and cleaning up stragglers close-in with AIM-9 Sidewinder and cannon. As such it is part of a succession of two-seat, twin-engined, radar-equipped night and all-weather 'bomber destroyers' that have served in the defence of the United Kingdom Air Defence Region (UKDAR) for over two-thirds of the RAF's history, (with only a slight gap between the retirement of the Javelin in April 1968 and entry to service of the Phantom FG.1 in September 1969). Under these circumstances the Lightning, and more recently the Eurofighter Typhoon, could be seen as the anomalies.



111 Squadron Tornado F.3 ZE734/JU in 90th Anniversary marking seen on 12 September 2008 in the static line-up for the next days RAF Leuchars Airshow; wear on the wing leading-edge slat and lighter grey 'blow-in' auxiliary intake doors are notable

The interception of bombers at long range and maintaining aircraft and crews at constant readiness for QRA to do so was the intended role for the Tornado F.3 and it has met this challenge day and night for twenty years. However the Tornado F.3 was also the UK's principal air defender and its crews trained for a multitude of air defence roles from straightforward 'dogfighting' training sorties with other fighters to the increasingly complicated world of the multi-type and multi-national Combined Air Operation (COMAO) which defined operations over the Gulf and the Balkans.

By 1990, just as the world began to change, the Tornado F.3 was equipping a peak of seven squadrons and an Operational Conversion Unit (OCU). The collapse of the Soviet Union and its sphere of influence followed by the first Gulf war and subsequent instability and military involvement both in that area and over the Balkans, kept the Tornado F.3 force busy but at the same time questioned the level of air defence required over the UK itself, which led to a reduction in the number of aircraft and squadrons.

The attacks on New York and Washington in September 2001 brought air defence of the UK back to the fore, placing greater demands on a much reduced force which has been exacerbated by the more recent and literal change in Russian fortunes which has allowed their resumption of long-range bomber patrols into the UKADR.

The Leuchars Wing

Leuchars holds responsibility for QRA for the northern half of the UK and out into the North Atlantic towards Iceland from a dedicated hard-



Close-up of the starboard fin area of overall medium grey scheme 111 Squadron Tornado F.3 ZE734/JU in 90th Anniversary marking seen on 12 September 2008 in the static line-up for the next days RAF Leuchars Airshow, fin flash is in red/white/blue despite the roundels being in dark blue/red

Leuchars and the Tornado F.3 than policing the UKADR. As one of the Royal Air Force's Expeditionary Air Wings, (125 EAW), the aircraft, crews and maintainers from Leuchars must remain current in the multitude of air defence tasks originating from the defence doctrines of the Cold War and which have evolved through the Balkans campaigns and both Gulf wars. Such skills are developed not only through the daily training routines of the Tornado F.3 force but in frequent exercises and deployments whether at Leuchars itself, elsewhere in the UK, or abroad.

Both Nos.43 and 111 Squadrons have a long association with Leuchars. No.43 Squadron returned to Leuchars in 1969 with the Phantom FG.1 and was joined there in 1975 by No.111

fin cap. Often aircraft were only differentiated by their two-letter fin codes but even this began to change when it was decided to give each airframe an individual two-letter code which it would retain irrespective of operator.

Over more recent years a more settled pattern appears to have developed although this is by no means absolute. No.43 Squadron aircraft are often seen with black and white checks and the squadron nickname 'Fighting Cocks' on the fin cap with the Fighting Cock emblem displayed mid-fin, whilst No.111 Squadron aircraft have a black fin cap with yellow lightning flash and the squadron crest worn mid-fin.

Two-letter tail codes are still worn with many aircraft still displaying a 'proper' 'G' or 'H' prefixed code, with some displaying part of the construction number behind the fin air intake. Nose markings are now the exception rather than the rule with some No.43 Squadron aircraft occasionally being seen with black and white checked fighter bars and some No.111 Squadron aircraft in special colour or markings schemes having yellow outlined black bars on the nose.

With the disbanding of Nos.25 and 56 (R) Squadrons in the spring of 2008, a rationalisation of the force has meant that at the time of writing,



Close-up of the port nose area of 111 Squadron Tornado F.3 ZE734/JU in 90th Anniversary marking seen on 12 September 2008. Crew names and Wing Commander's pennant can be seen along with fighter bars on either side of the roundel as can the more usual grille vent behind the cockpit. The light streaks are rain drops highlighted by the late afternoon sun as a prelude to the foul weather that marked the public event next day...

"The Tornado F.3 was intended to meet a perceived Soviet bomber threat out over the North Atlantic..."

ened facility that replaced the earlier open 'Q' sheds from the days of the Lightning and Phantom. Not surprisingly, newly trained Tornado F.3 aircrew joining one of the operational squadrons from what had been the OCU and is now the 43 Squadron Training Flight, face qualifying in the QRA role as an early goal. Other new skills to be acquired that form the daily routine of an operational squadron include AAR, NVG use, weapons use including air-to-air and air-to-ground gunnery as well as low-level/low speed intercepts. The latter, often practiced with Leuchars based Grob Tutor or Gazelle helicopter assets, is frequently undertaken in the area in which I live and provides an impressive and noisy display with pairs of Tornado F.3s taking it in turns to dive on the target as the other pulls around hard for their turn.

There is more to the roles of both RAF



Close-up of the starboard nose area of 111 Squadron Tornado F.3 ZE734/JU in 90th Anniversary marking seen on 12 September 2008 in the static line-up for the next days RAF Leuchars Airshow. Fighter bars can be seen on either side of the roundel and the strong afternoon sunlight highlights the steel cannon muzzle area

Squadron flying Phantom FGR.2s, which were later exchanged for ex-Royal Navy FG.1s in order to standardise the type at one location. Both squadrons remained there with their Phantoms until re-equipped with the Tornado F.3 but only time will tell if they will surrender their F.3s to become the final two Typhoon units.

On re-equipping with the Tornado F.3, both squadrons displayed very distinctive markings. No.43 Squadron wore its black and white checked 'fighter bars' on either side of the roundel on the forward fuselage along with their emblematic Fighting Cock on the tail, initially in the 'low-viz' colours carried on the Phantom but after a very short time in full colour, with fin codes in the range GA-GX.

No.111 Sqn. had a yellow edged black lightning flash incorporating the roundel along the forward fuselage with the unit's Palestine Cross, crossed swords and axes crest on the tail, and fin codes in the range HA-HX.

This situation would only last a relatively short time and by the late 1990s such fully marked aircraft were the exception rather than the rule, a situation possibly exacerbated by movement within the F.3 fleet and the operational demands placed by conflict and policing roles over the Balkans and the Middle East.

At its lowest point, from a modelling point of view, No.43 Squadron aircraft markings were reduced solely to the Fighting Cock and small fin codes while for a time No.111 Squadron adopted a black/very dark grey stencilled bar incorporating their crest and a code letter in outline form on the

airframes in the markings of these units are being operated by both Nos.43 and 111 Squadrons.

During their service both squadrons have flown specially marked aircraft to mark particular anniversaries or events which have generally involved black tails, and sometimes spines, carrying variations on the unit markings. In 2006 a No.43 Squadron aircraft was rather (in)famously painted overall gloss black but technical demands and rumoured internal politics in the rarefied heights of the RAF meant that this was very short-lived and allegedly it was ordained that the aircraft must not appear at that year's Leuchars Airshow even if it was the only serviceable aircraft on the base – although oddly it did appear on national television and MoD official website coverage of the event.

With that one exception the Tornado F.3 has served, with slight variations, in the same colour scheme throughout its service. Originally this was Satin Barley Grey over Light Aircraft Grey with an angled demarcation well below the fuselage, but with changes in paint standards there has been a move towards a matt finish with the upper colour now being Camouflage Grey and occasionally a more regular demarcation along the lower fuselage.



43 Squadron Tornado F.3 ZE797/GF in a previous flagship colour scheme returns to Leuchars on 14 June 2006 after a QRA scramble and is armed with live ASRAAM AAM on the wing pylons and Skyflash AAMs under the fuselage. As is normal for this configuration 495 Gallon/2250 Litre droptanks are carried



The Tornado F.3 carries one 27mm Mauser cannon which is in the lower forward starboard fuselage as seen in this close-up of the muzzle blast shield and cannon muzzle which is sealed with a red frangible cap to prevent debris ingress

There is some variety in this with some aircraft having an almost patchwork scheme of different greys on different panels. In this 'lighter greys colour scheme' national markings are in Pale Blue/Pale Red, serials and codes in white and safety markings in paler shades of yellow and red. For a few years there has been a rather slow movement to standardise both the Tornado F.3 and GR.4



Although rarely used in the early years of Tornado F.3 service, the aircraft can be operated with the outer wing pylons activated and has increasingly done so to carry additional defensive stores in war zones since the mid-1990s. Here 111 Squadron's ZE162/HM displays a BOZ-107 dispenser on the port outer pylon – the similarly shaped TRD can also be carried

fleets in an overall Medium Sea Grey colour scheme with Red/Blue national markings, black serials and codes and bolder coloured safety markings, but it is not unusual to see aircraft wearing a mix of 'borrowed' panels and stores from both colour schemes.

The photos

Most of the accompanying images were taken at RAF Leuchars, either 'over the fence' or during arranged visits to exercises such as the twice-yearly Combined Qualified Weapons Instructors Courses (CQWIC) held either there, or more



Unlike the Tornado GR.4/IDS and its starboard mounted 'bolt-on' AAR probe the F.3 has an integral probe mounted in the forward port fuselage. If a sortie has involved AAR it is common practice for the aircraft to taxi in with the probe extended as a check for obvious damage as displayed by this 43 Squadron example in June 2007

recently at RAF Kinloss. Thanks are given to Fiona Carle and Keith Wardlaw from the Media and Communications Offices at Kinloss and Leuchars, Su McGinlay from the Leuchars Photo-Section and also 'Fraz' for getting me to the right place at the right time for the TLP deployment returning home on the 2008 Leuchars Airshow arrivals day.



A Pair of inert AIM-9L Sidewinder AAMs being carried on the port inner wing pylon of 111 Squadron Tornado F.3 ZE811/HB in September 1990. The fuselage mounted Skyflash AAMs are just visible at the bottom of the image



Deployment in a variety of war zones since the 1990s has seen the outer wing pylons of the Tornado F.3 activated to carry additional defensive stores. Here 111 Squadron's ZE162/HM carries a Phimat dispenser on the starboard outer pylon. This was initially carried on a missile launch rail but acquisition of the BOL dispenser/launch rail as seen inboard on the inner pylon has freed up this position up for offensive weaponry

Modelling a Leuchars Based Tornado F.3

The Panavia Tornado F.3 is, or at least has been, well represented as an injected moulded kit in most of the popular scales with offerings from Dragon in 1/144; Matchbox (F.2 also boxed by Revell), Italeri (also boxed by Revell), Airfix and Hasegawa in 1/72; Airfix and Italeri in 1/48 and Revell in 1/32 (F.2). All have their positive and negative aspects and over the years there have been many after-market parts from a multitude of sources to embellish them.

Of these I can only recall the final 1/72 Airfix boxing before the takeover by Hornby as having a Leuchars option with markings for a black-tailed, lightning-flashed, No.111 Squadron example. Similarly the final 1/48 Airfix incarnation of the F.3 has a Leuchars aircraft taking part in 'Operation Telic' during 2003, but this lacks unit markings.

However decal sheets have been produced for one or both current Leuchars squadrons from Xtradecal in 1/144 and 1/72, Modeldecal with early schemes in 1/72, Model Alliance in 1/72 and 1/48 – including the all-black aircraft – and Flightpath in 1/32. **MAM**



Tornado F.3 ZE983/WY in the light greys colour scheme and current 111 Squadron markings gets airborne from Leuchars carrying 330 gallon/1500 litre drop tanks, with that under the port wing still in Dark Green/Dark Sea Grey, and an inert ASRAAM AAM visible on the outer launch rail. (Courtesy of RAF Leuchars Photo Section)



The photo that should have alerted us to the Camouflage Grey/Medium Sea Grey two-tone finish...

Buccaneer Blunder...

In the December 2008 issue of 'Model Aircraft Monthly', Paul Lucas made a major mistake towards the end of his Airfile on the Buccaneer in RAF service. In this follow up article, Paul dons sackcloth and ashes, forsakes traditional seasonal fayre for a very large helping of humble pie and attempts to put the record straight...

As regular readers will probably have noticed, it is not very often that I write on a subject as 'modern' as the Buccaneer. There are two main reasons for this. The first is that I personally have no great intrinsic interest in modern (sic) jet aircraft from about 1980 onwards. This stems largely from the fact that in the early 1980s I spectacularly failed to pass the flying aptitude tests at the RAF Officer and Aircrew Selection Centre and was thus denied a career as one of Her Majesty's steely eyed aerial assassins.

Upon being informed by the Wing Commander who took the interview that the only meteoric rise my Service career would be likely to experience would probably be facilitated by messers Martin Baker, purveyors of fine ejection seats to the chosen few, I decided that although I was disappointed, there was no point in dwelling on it and I would have to follow an alternative career. Thus I forced myself to lose interest in the contemporary military aviation of the day and for some reason it has never subsequently returned.

In practical terms as a writer today, this means that my own personal reference library tends to peter out from about 1982 with regard to such things as RAF Yearbooks and contemporary magazines such as 'Air Pictorial' and the like which can make writing on subjects after this date a little difficult. Having failed to keep up to date with such changes as have overtaken the Service in the years since, I find that today, my general knowledge of the period 1982 to the present is comparatively poor. Having said this however, I did later follow a career path which involved some professional training as a historian and in so doing never lost my interest in the more historical aspects of the RAF's history. This brings me neatly to the sec-

ond reason, the 30 Year Rule.

For those readers who are perhaps not au-fait with this, it should be explained that since at least the end of the Second World War, it has been the policy of the British government to withhold government documents considered to be of historical interest and thus worth preserving from public scrutiny for a minimum period of 30 Years. After this time, the contents were reviewed by the originating authority and if deemed to be no longer sensitive, they were then released to the care of what was then called the Public Record Office, where they could be read by members of the general public. This rule remained in force until quite recently when most government departments became required to comply with the provisions of the Freedom of Information Act which in theory allows the private citizen to ask a government department for specific information. The new Act however does not apply to matters affecting national security.

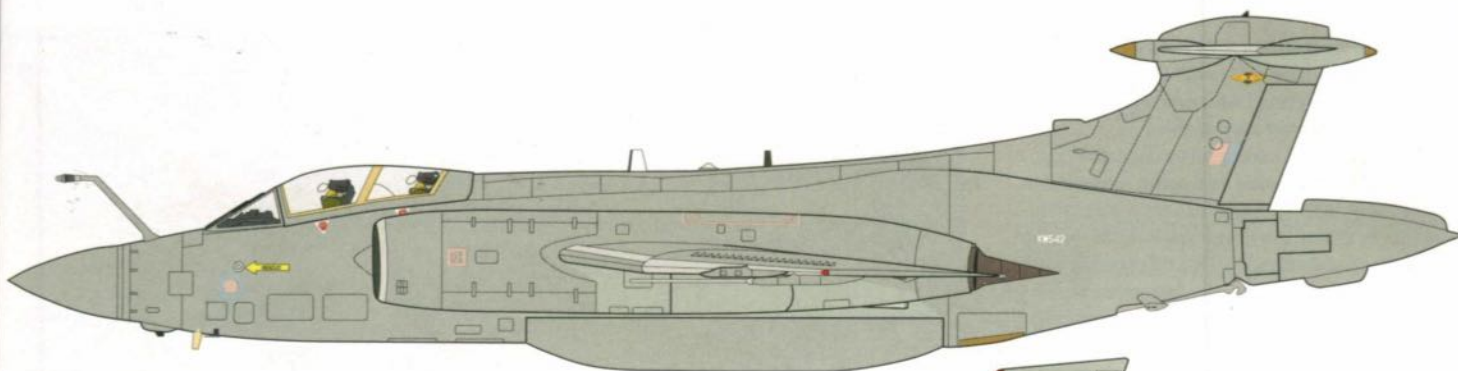
The 30 Year, 50 Year or 100 Years in which the file might be sealed, starts counting down from the date the file is closed. Thus at the time that this

article is being written at the beginning of December 2008, it is possible to obtain access to those historical RAF camouflage and marking documents which have been chosen for preservation up to January 1977. Thus, when asked to write an article dealing with the Buccaneer, I was confident that I would be able to manage up to about 1980, but after that there might be a problem as my own general knowledge of the period was poor and hard information from primary sources would be impossible to obtain. Thus reliance would have to be placed on a variety of photographic and secondary source materials for the later period and this is what caused the problems towards the end of the article.

The first problem with the article concerns the wraparound camouflage scheme which was introduced following the RAF's participation in Red Flag 9-77. In the main body of the text I failed to make it clear that there were two slightly different camouflage patterns applied to the under surfaces of those aircraft which were painted by RAF Germany and those which were painted by UK-based Strike Command. Exactly why this difference occurred is



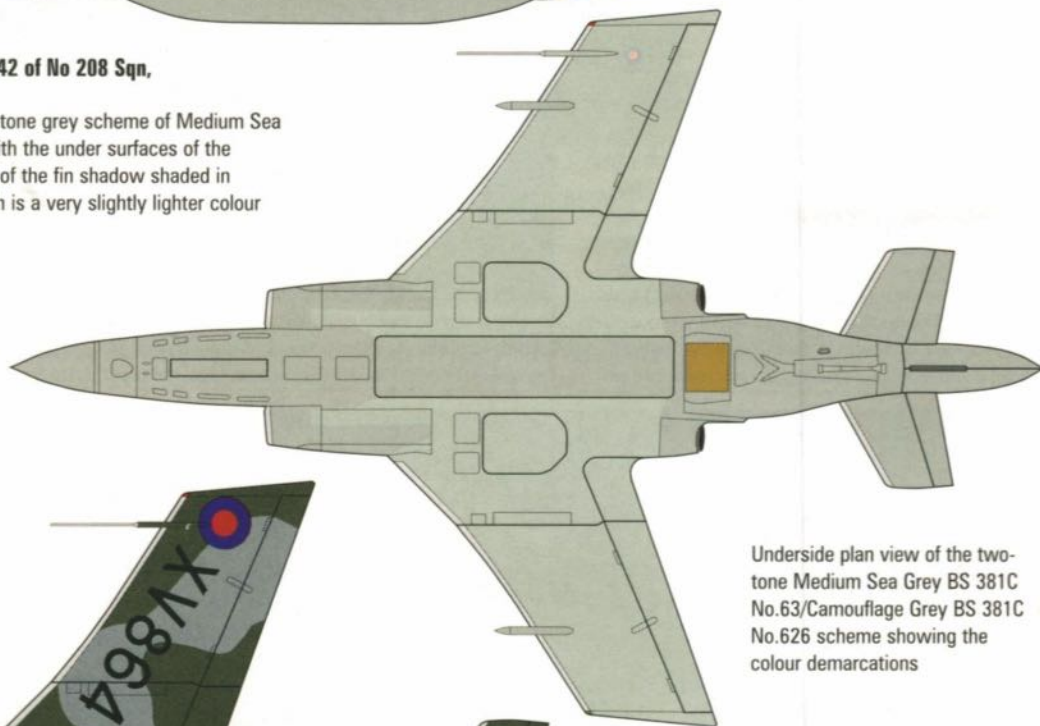
Buccaneer S.2B, XV352 of 237 OCU in the Camouflage Grey/Medium Sea Grey scheme



**Hawker Siddeley Buccaneer S.2B XW542 of No 208 Sqn,
RAF Lossiemouth, Morayshire, 1991**

XW542 is illustrated finished in the two-tone grey scheme of Medium Sea Grey BS 381C No.637 upper surfaces with the under surfaces of the mainplanes and part of the bullet on top of the fin shadow shaded in Camouflage Grey BS 381C No.626 which is a very slightly lighter colour

Note: These illustrations are based upon the painting diagram used by the paint shop personnel at RAF Lossiemouth when they were refinishing the Buccaneers based there



Underside plan view of the two-tone Medium Sea Grey BS 381C No.63/Camouflage Grey BS 381C No.626 scheme showing the colour demarcations



Under surface wraparound camouflage pattern of RAF Germany-based Buccaneers



Under surface wraparound camouflage pattern of UK-based Buccaneers

not known for sure, but is thought to be a result of the aircraft being painted in different paint shops which each interpreted whatever instructions were given in a slightly different manner.

Both schemes were actually illustrated by Peter Scott in the article and some reference to there being different patterns was made in the caption to one of the drawings, but this was not made absolutely clear and for this I can only apologise. Peter has redrawn the two variations in the under surface camouflage and they are reproduced here for comparison with each other and future reference.

This however was a comparatively minor error of omission in comparison to the outright 'balls-up' I made of trying to describe the Buccaneer's final grey scheme.

I knew that there were a few Buccaneers which were painted in some sort of grey, but I had no real idea of exactly which shade(s) were used. I was able to obtain some idea from various books and magazine articles, but an authoritative reference was lacking. The general consensus of opinion seemed to be that the Buccaneers were overall Medium Sea Grey and I have to say that having studied the available photographs I could see no



Four Buccaneers in the 'old' and 'new' schemes immediately prior to the type's retirement from frontline RAF service – the middle pair of Buccaneers are in the 'old' Dark Green/Dark Sea Grey wraparound scheme and two 'outer' aircraft are in the 'new' Camouflage Grey/Medium Sea Grey scheme, albeit the aircraft in the foreground has a Dark Green/Dark Sea Grey intake...



Buccaneer S.2B, XV332 in the Camouflage Grey/Medium Sea Grey scheme – still not 'obvious' even when you look closely...

evidence of there being two greys present, but here I fell headlong into a trap of my own making.

I compared the colour photographs which I had with my copy of BS 381C and to my eye, the Buccaneers appeared to be a closer match for Camouflage Grey than Medium Sea Grey and I knew that Camouflage Grey had been formulated for just this kind of application. I therefore disregarded the general consensus and described the colour scheme as being overall Camouflage Grey. The article was then submitted and went through the editorial process without being questioned.

It was not until the editorial team had arrived at IPMS(UK) Scale Modelworld 2008, some three days after the December 2008 issue of 'Model Aircraft Monthly' had gone to the printers and was thus beyond recall, that the alarm bells began to go off.

Having been informed that 'Model Aircraft Monthly' would be publishing an article about the Buccaneer in the Airfile series which is sponsored by Airfix, Trevor Snowden, research and Development Director at Hornby/Airfix, had come up with a copy of the painting diagram showing the grey scheme as applied to the Buccaneer which had been obtained from the RAF at Lossiemouth several years previously when Airfix were preparing their 1/48 scale Buccaneer kits... and the awful truth was revealed.

According to this drawing, most of the Buccaneer was finished in Medium Sea Grey BS 381C No.637. The under surfaces of the mainplanes and part of the bullet on top of the fin were however

shadow shaded in Camouflage Grey BS 381C No.626 which is a very slightly lighter colour.

The whole idea of shadow shading in this way is to paint those parts of the aircraft which fall into shadow a lighter colour and thus make the aircraft appear to be one colour overall. The exact extent of this shadow shading is shown by Peter Scott's artwork reproduced here which has been taken from the original RAF paint shop drawing.

It should be noted that the demarcation lines

between the Medium Sea Grey and Camouflage Grey follow panel lines in the aircraft's skin. As an exercise in shadow shading, this scheme seems to have been particularly successful. It certainly fooled me and judging from the number of places I have seen reference to Buccaneers being overall Medium Sea Grey, one or two other people as well.

There have been one or two pointed questions asked of the editorial team as a result of this 'cock up', as to why the error was not spotted and questioned before going to print, especially in the light of the photograph at the top of page ix which clearly shows a Buccaneer in a two-tone grey scheme.

Whilst it is tempting to blame my friend and yours, the Group Editor, (I think you will find that he is usually to blame when things go wrong), in this instance I have to take full responsibility for this error myself because when all is said and done, it is my name on the article, and as the author, verifying the accuracy of the information it contains is my responsibility and no one else's.

I can only apologise for the error, and will try to do better next time... **MAM**



Buccaneer S.2B, XV542 of No 208 Sqn in the Camouflage Grey/Medium Sea Grey scheme

Forum

Barley Grey – urban myth solved?

Dear Neil,

In response to Airfile 7, The English Electric Canberra PR.9 by Paul Lucas in the November 2008 Vol 7/11 issue, and his comment on page viii about the 'popular legend' regarding the name change from Barley Grey to Camouflage Grey, may I add the following as I think that I may be responsible for this urban myth.

Many years ago I was an RAF electrician working on Jaguars at RAF Abingdon and during the late 1980s and early 1990s I had several articles published on various subjects at Abingdon. One of these arti-



cles was 'Buccing Colours' published in the August 1991 issue of 'Scale Models' which covered several changes in Buccaneer camouflage and special colour schemes.

In this article I mentioned the name change from Barley to Cam-

ouflage Grey and how 'somebody, somewhere, did not like the fact that Barley Grey was named after its creator, P J Barley', in relation to this new camouflage appearing for the first time on Buccaneer XW543. What I should have elaborated

on was the fact that Mr Barley was at Abingdon on 15 August 1990 for the roll out of XW543 and as I photographed it, I got chatting with Mr Barley and it was he who related the story of the name change to me. He was very philosophical about it as there was not a lot he could do being little more than an employee.

As I have seen this name change mentioned as an urban legend several times over the years I hope that I have now cleared things up.

Tom Ross
via email

McArthur and Zero lengths query...

Dear Neil,

I enjoy your magazine, and I thought your collective readership might have the encyclopedic knowledge of aviation publications to help me find an article I need to provide as a reference.

The article was part of a cover story on the A6M Zero. I am about 60% sure that the article's origin was American, probably with the Planes of Fame A6M5 poking out from the cover in a close-up, although it could have been in 'Aeroplane', or 'Warbirds'. It might have been 5 years, but more likely less than 3 years ago. I just need the magazine title, month and year.

It mentions that General Douglas MacArthur ordered all Japanese combat aircraft blueprints to be destroyed. The Japanese 'cheated' when it came to the Zero, and offered a credible substitute.

Incidentally, this story is part of a discovery I made that Nakajima-built A6M5 Model 52 Zeros may have had shorter tails by about 6 to 8 inches compared to Mitsubishi-made Zeros. Sounds incredible, I know, but the photographic record about this looks unambiguous...

The only such unaltered airframe in the world remaining, with the rudder hinge AHEAD of the trailing edge of the elevators as per Nakajima, instead of 3 inches behind, as per Mitsubishi, is suspended at the NASM. I have spoken to the curator of the NASM, Mr Tom Dietz, but in view of the current way in which the Zero is exhibited, suspended 10 foot high off the ground, he is unable to provide a canopy rear to rudder hinge measurement...

Unfortunately, the Planes of Fame's Nakajima-built A6M5 now sports a 'longer' (sic) Mitsubishi tail, the original having been eaten up by an errand Helldiver in 1945! I am convinced there are currently no existing drawings of the Nakajima Zero showing the shorter tail.

The Nakajima rudder hinge ahead of the elevator trailing edge is visible on the A6M2 that was a former Commemorative Air Force aircraft, (initially re-built from several airframes in Canada), and in the 90% scratchbuilt Kure Museum's



A6M7. The pristine, single-origin, NASM A6M5 I am referring to is the ONLY one not originating from scratch or several airframes.

If my theory was proven, it would implicate the need for a NEW kit... Note that the canopy rear to rudder hinge measurement is 137 inches on the current 1/48 scale Tamiya Model 52, which is confirmed by the same measurement I kindly got from the Commemorative Air Force's A6M3. I expect 129 to 131 inches on the NASM Zero. Note that the dog leg in the rudder hinge is exactly 4.5 inches long, and makes a useful reference on photos.

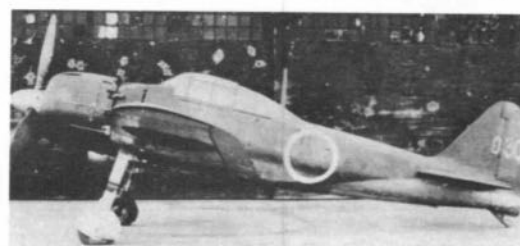
Of note also is that at least two things make the shorter tail less

noticeable. The steeper leading edge of the fin has its corner with the spine 'softened' by the spine being slightly more horizontal. Also the change to the diagonal camouflage demarcation was probably intended to make the shorter tail less apparent – perhaps to avoid the stigma of having tampered with the design? A potentially important third point is that the tail may be less deep, making it look longer.

I know this notion may prove very controversial – I can confidently predict NO self-respecting Zero

in profile in front of a factory, and the Mitsubishi in profile taking off. Note that if the canopy length is used as a reference point, you cannot go wrong with the rudder hinge position, because even a distorted photo will keep various items IN proportion IF the comparison is kept on ONE axis, in this case the horizontal.

Interpretation of photos is a tricky business however, and might not convince many people. Note as an example that on the above site there is a plan view photo that sug-



expert will concur on my theory...

There are almost certainly no documents other than wartime photos to demonstrate the point I am making. And the the photos I did point out proved difficult to interpret for others, although I feel they are pretty obvious when you know what to look for, bearing in mind that the different camouflage paint demarcation and 'straighter' spine all conspire to make the shorter length and steeper fin angle less conspicuous. The 6 to 8 inches is really surprisingly small on the Zero, which was not that small an aircraft. The photos I used can be found at Rod's Warbird Pictures, the critical ones being the Nakajima

gests a steeper sweep of the main wing leading edges; a distortion... In any case, if my theory is proved correct, we may then have to convince kit manufacturers to invest large amounts of money into new fuselages/tailplanes...

If the NASM could provide the canopy to rudder hinge measurements and plan view photo of the tailplanes, then it could prove/disprove my theory... If any of your readers could obtain this measurement from the NASM, I will take a life subscription to 'MAM', I promise!

Gaston Marty
via email

Soviet A-20 identification

Dear Neil,

I was particularly interested in the three articles covering the A-20 in Soviet service, in the October, November and December 2008 issues of 'MAM', as I only build models of aircraft I have seen and the only A-20 I've seen is the one at Monino in Russia.

This particular A-20 is painted as s/n 310052 'white 14'.

In 'Part Three' (in the December 2008 issue), it states that the Monino example crashed while being delivered and saw no combat – does that mean 'saw no service'?

In Part Two, (November 2008 issue), the photo at the top of page 23 shows 310052 and two others 'being prepared for ferrying to the USSR'. The photo at the bottom of page 29 in the same issue shows 310052 with a very faded '14' in service with the 1st Guards Mine-Laying



and Torpedo-Bombing Regiment. The torpedo is just visible.

So is the Monino example really 310052 or is it just painted up as such? Given the Russian's history of judicious use of the paintbrush this is possible but would they go to such trouble when other aircraft there are just left unmarked?

Is the history wrong and did it actually enter service after all but crashed before any combat operation?

The Monino example has different engines from the one in the photo on p29 but given that this is a re-build that doesn't mean that they are the originals.

In the scheme of things, a minor issue, but I am intrigued. Hopefully someone can shed some light on the subject...

Richard Gault
Dunoon, Scotland

Vladimir Kotelnikov replies...

The A-20 airframe currently displayed in Monino crashed during its ferry flight, but was subsequently recovered from the crash sight, restored and incorrectly painted up as 310052 'white 14'.

A-20G 310052 'white 14' was indeed an operational machine, and served with the 1st Guards Mine-Laying and Torpedo-Bombing Regiment. However, it has nothing in common with the A-20 currently in the Monino collection which is just painted to imitate this operational aircraft.

Wrong Auster...

Dear Neil,

I regret to inform you that the photo that appears at the top of page 7, of the Indo-Pakistan Air Wars article, in the December 2009, Vol 7/12 issue, is not an Auster AOP6.

The reason is that the Auster AOP6 had external trailing edge flaps, and the bottom rear corner of

the canopy would be formed by a horizontal longeron and a vertical fuselage frame, forming a right angled corner, and not the inclined edge shown in the photo.

Apart from this the rest of the article was very informative.

Pete Munro
via email



SAAF Baltimores

Dear Neil,

I enjoyed Tony O'Toole's articles on the Baltimore in the August and September 2008 issues of 'MAM' (Vols 7/8 and 7/9), and it came just at the right time for me! I am hoping we will get more marking options for the new Classic Airframes 1/48 kit of the Baltimore. However, I am writing to correct a couple of errors and offer some information, as I know the SAAF is a bit of a 'dark horse' as far as research goes.

Tony mentioned in an addendum in the 'Forum' readers letters pages in the September issue, that the double code letters referred to in the first instalment, (in the August issue), is incorrect, only to state that it belonged to No.15 Sqn. He is correct in the addendum that it is No.21 Sqn SAAF. It was the idea of Alec Jandrell, the CO, but was stopped by the DAF HQ. Two of the Baltimores kept their double codes for a while, ie 'BB' and 'YY'.

No.15 Sqn never had double codes on any of their aircraft. He also mentions that No.16 Sqn SAAF oper-



ated Baltimores, which is wrong. They had Bisleys until August 1942, when they started working with Beauforts and a few Marylands until November 1943, when they finally converted on to Beaufighters – that they flew till the end of the war.

The Baltimore coded 'Z' over the water may be from No 15 Sqn and not No.13 (Hellenic) Sqn. I have found it amongst the photos of a chap that was killed on No.15 Sqn. Their aircraft looked the same.

The reason I point this out is that in my research for a new book, 'The Aegean Pirates', a history of No.15 SAAF during World War Two, it transpired that the Baltimores had a 40

hour maintenance that was done at the base, but that they were sent to the MU for their 60 hour service. They were then sent back to any of the Baltimore squadrons, and not necessarily from whence they came.

I have thus seen Baltimores that do have the small nose code letter, which was ex-No.21 SAAF, or even No.454 RAAF, or No.500 RAF. I don't know which of those two will have had the code on the nose? No.21 SAAF did.

The other difficulty is that all of No.201 Naval Co-Op Group's photographs were eventually sent to No.454 RAAF Sqn for development and interpretation. Many of the pho-

tos found in their archives belong to the other squadrons in the Group.

The upper surface view of the Baltimore at the bottom of page 41 of the September issue has very light central portions to its upper wing roundels which look typical of SAAF Orange. The Baltimore coded 'G' on page 43 is FW537 and was flown by the CO, Major Cormack, on many occasions. In fact, my co-Author, Dr Gerald Thompson was the WT/AG on that aircraft. Hope this is of some help?

Stefaan Bouwer
via email

A salutary tale for all would-be contributors...

Dear Neil,
I am a regular reader of 'Model Aircraft Monthly' and was very pleased to spot the Trumpeter Wellington on the front page of your December 2008 issue – but immediately very disappointed with myself as I have been very lazy.

Earlier this year, I undertook making the same kit – I am by no means a professional modeller but keen to learn techniques which can be picked up from reading 'MAM', so the Trumpeter Wellington was quite a challenge for my skills. As soon as I started on the interior, I felt the urge to add more to the kit and opted to focus on adding some interior detail – I know it's there, even if it no longer visible! I used several aftermarket detailing kits and was proud with the end result.

I then approached a friend of mine who is a professional photographer who offered to take some gallery shots as I had intend-



ed to send them into you with the hope that my work might get a mention or even published – but I got distracted, (by a similar project on an Airfix Sunderland), and never got around to sending anything into you.

Having now seen the December issue of 'MAM', I could kick myself for not contacting you sooner. Both the Wellington kits featured are superb, I would be grateful if you could send on my congratulations to both Richard Farrar and Chris Clay – although my model does not come close in comparison to their masterpieces, I was very pleased to see and read about both of their projects.

John Leah
via email



Forgotten Squadron's colours – the final word..?

Dear Neil,
I was most interested to read the responses to my article, (printed in the November 2008 issue), on the No.608 Sqn Vampire, and the colour of their squadron marking, in last month's 'Forum'. I must admit that when I used bright yellow as the diagonal I was trying to provoke some form of response as to the shade of green. If I had used green I probably would not have got any reaction.

In my article I said that I remembered it as a dirty shade of yellow, Alan W Hall in his article on single-seat Vampires in the June 1992 issue of 'Scale Aircraft Modelling' states yellow whilst Mike Bowyer in his article on the Royal Auxiliary Air Force in the October issue of the same magazine states pale green,

and Roger Lindsay, in his letter in response to my article, states bright medium green, whereas Mr Thompson's letter says his document shows a green erring to blue green for the stripe!

May I suggest that the colour was likely to be more a lime green shade erring towards the yellow end of the green part of the spectrum rather than the blue end often shown in print. So even now there is no hand on heart, 100% cast iron proof or consensus as to the shade of green used in No.608 Sqn's colour.

As I lived just over a mile from the northern end of the main runway at the end of the downwind leg of the approach, and as a teenager misspent most Saturday and Sunday afternoons at a World War Two pill box by the perimeter track, near

the end of the runway, past which I saw the aircraft taxi many times for take-off, I am now fairly confident in my assertion, which is unfortunately unlikely to be confirmed one way or the other after the passage of over 50 years.

Although there were several variations in the squadron marking used during the 1950s, by far the most common was the one which was symmetrical about the roundel with the dividing band being uppermost next to the roundel and sloping down to the outer extremities of the marking on either side.

One further point regarding the squadron markings, which I do not as yet understand, is that most, if not all, auxiliary squadrons which had squadron markings before World War Two used the same markings

post-war. Why did No.608 change from the turquoise and black triangular bars similar to Nos 600,601,604 and 607 Squadrons who retained their pre-war markings post-war?

Mr Thompson's letter is also very interesting, particularly if it is an official document in his possession. Although it was notoriously difficult to achieve an accurate rendition of the desired colour when printing in those far off days, it is possible that the official colours should have been as shown in the document. I am fairly confident however that the red and blue used were those used in the aircraft markings.

Peter Brown
North Ferriby, East Yorkshire

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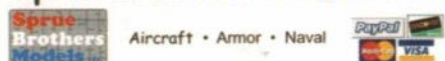
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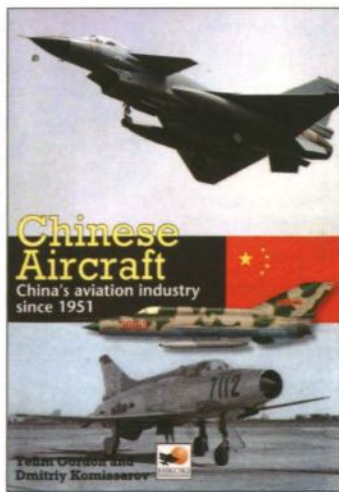
China's aviation industry since 1951

This is Crécy's latest book under the Hikoki label and what a book it is! As far as I am aware this is the first book published in English covering this subject – certainly in such depth.

Sorting out Soviet aircraft designations has always been difficult, as they always seem to have two, but this is nothing compared with the Chinese! Having no indigenously designed aircraft, they purchased machines from the Soviet Union and then built them under licence with their own designation. But then they started to modify them, thus producing aircraft unique to them and, eventually wholly, Chinese designs.

After a chapter chronicling the Chinese aircraft industry we move to the first section dealing with the actual aircraft, in this case 'Fighters'. Each individual variant of each aircraft is explained. The first machine the Chinese decided to build under licence was the MiG-15 but this was abandoned and they only produced the MiG-15UTI, designated Shenyang JJ-2.

Following this was the MiG-17 and so started the modification process. One such machine that was not adopted was the Shenyang J-5 (MiG-17F) Torpedo Bomber, which



by Yefim Gordon and Dmitry Komissarov
Crécy Publishing
UK price £34.95
ISBN 9 781902 109046
303 x 215mm, Hardback 312 pp

must have been quite a sight. Then followed the later Soviet fighters – MiG-19 and MiG-21, all modified for Chinese needs. Altogether there are seventeen machines described, some single types, others in a series. For instance the J-7 (MiG-21) section contains pages of side-view line drawings illustrating no less than twenty-one variants.

It goes without saying that the text is supported with masses of colour photographs and colour profiles. I could spend a lot longer on this section but after mentioning the fully described J-10 family of indigenous fighters that concludes this chapter, I must move on.

The next section is entitled 'Bombers'. Again we start with imports and the well-known conversions of the Tu-4 (B-29). Refitted with WJ-6 turbo-props and converted to carry reconnaissance drones it changed its appearance but not as much as installing the dish. We then move on to the Zian H-6 (Tu-16). Again it was modified for Chinese needs. Another interesting conversion was the Qing-6, which was a re-engined Beriev Be-6, followed by the mighty Harbin SH-5 Bomber/ASW flying boat.

The following categories are 'Strike Aircraft', then 'Trainers', 'Airliners' and 'Transports'. Again, containing many fascinating subjects. For instance, there is the Shaanxi Y-8 family of four-engined transports, an aircraft with eighteen derivatives illustrated.

Chapter 7 covers 'Special Mission Aircraft' and it includes details of the Xian KJ-2000 with its AEW dish – a

real showstopper. There are then chapters on 'Light Utility Aircraft', 'Helicopters' and even 'UAV's.

This book is magnificent, it is one of the most comprehensive I have ever had the pleasure of reading. With over 650 photographs, over 100 side-view drawings and at least 110 colour profiles it must be a best seller and is a book that I heartily recommend.

Ernie Lee

Thanks to Crécy Publishing for the review copy.



Warpaint 69

Martin B-26 Marauder

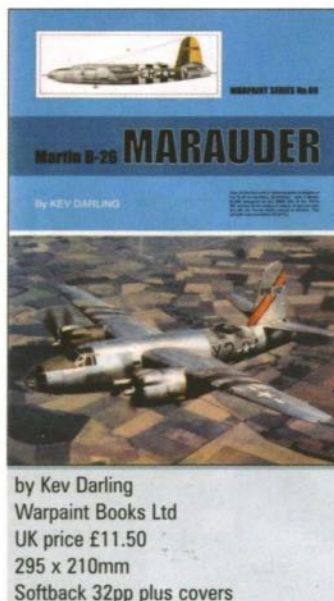
It had to happen of course, as soon as I had completed the Valom Marauder Mk 1a, Alan Hall, who sadly died recently, produces a Warpaint on it. I can hear him laughing at me now – from wherever he is!

This aeroplane started out badly, with many of the early ones crashing on landing. The problem was the short wingspan, which meant a high landing speed. This was rectified with later models and there was also an increase to the horizontal stabilizers and armament changes.

The late Alan Hall was a modeller first and foremost and these books are produced to satisfy them. Most of us like to know something about the subject we are building and this, like previous monographs, satisfies that need.

The text is informative and easy to digest, covering as it does the

development and operations of the various Marks. For historical interest there is a production list and also one listing the operational units. There are plenty of photographs, two pages of which are close-ups.



by Kev Darling
Warpaint Books Ltd
UK price £11.50
295 x 210mm
Softback 32pp plus covers

One photograph that might interest you is a shot of B-26A 41-7462, which was retained in the States for trial purposes. It is shown carrying a

torpedo – and is the subject of a forthcoming kit from Valom.

When building the Valom B-26A I found little useful information on this aircraft, but you will not have this trouble now because all the variants are covered in the 1/72 scale drawings. We have the usual healthy crop of colour profiles, depicting a good many schemes. If you are into nose-art then you will also be satisfied and there is even one in South African markings with a bathing beauty decorating the nose. If you do not have a kit in stock then the kit, decals and accessory list will make you realise this is no excuse for not building one.

This is another excellent volume to add to your collection and a fitting epitaph for Alan Hall.

Ernie Lee

Thanks to Warpaint Books Ltd for the review copy.

Warpaint 68

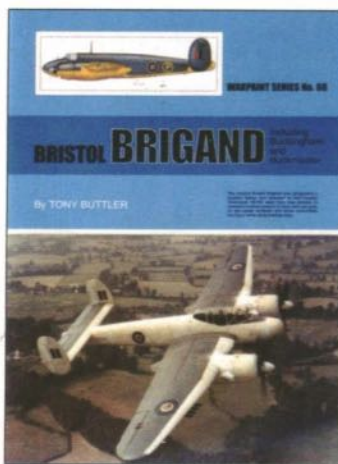
Bristol Brigand – including the Buckingham and Buckmaster

A monograph on this aircraft has been a long time coming and as the Brigand served primarily overseas it was not an easy aeroplane to spot. I myself had only one encounter with the beast, and that was at Bahrain in 1951 when aircraft of No.84 Squadron came on a visit.

Of the three aircraft types the Brigand was the most successful and with the promise of all three, in 1/72 scale, from Valom, I can see this monograph becoming popular.

The development of all three variants is described in a single chapter and is profusely illustrated. The Brigand is not well documented elsewhere and the other two variants even less, so it was interesting to learn about these less successful sub-types.

The specification for the Buckingham looked good, a fast medium bomber with its offensive load augmented with four fixed forward-



by Tony Buttler
Warpaint Books Ltd
UK price £10.00
296 x 210mm, Softback 28pp

firing machine guns in the nose and two defensive turrets, but it had problems and never went into service in that role, although some

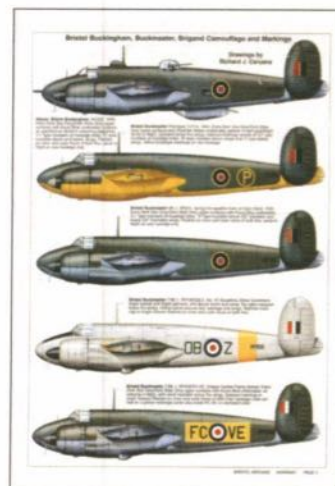
were converted into transport and courier aircraft.

The Buckingham was created as a conversion trainer for prospective Brigand pilots, although again few were actually used. This left the Brigand, which did see service in Malaya, and the lion's share of the book is devoted to this machine.

The detail section is only two pages, and that covers all three types. I suppose that it must have been difficult to obtain much information on these aircraft, however, the author has done a sterling job and there is plenty here to help the prospective modeller.

The 1/72 scale drawings are of the Brigand B Mk 1 with extra views to illustrate the TF Mk 1, T Mk 5, Buckmaster and Buckingham. To 'gild the lily' there are twenty-six colour profiles and a five-view of the Brigand B Mk 1 of No.84 Squadron.

I have waited a long time for this monograph and thankfully it came



before the kits were issued, so I am now prepared, ready and waiting...

Ernie Lee

Thanks to Warpaint Books Ltd for the review copy.

Air Force – An Illustrated History

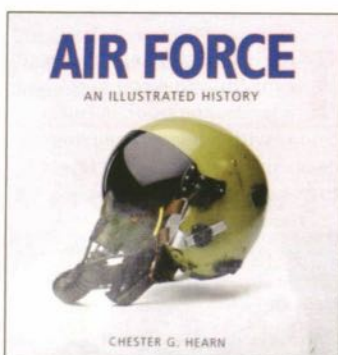
This can best be described as a potted history of the United States Air Force and its predecessor the US Army Air Force. It consists of easily digestible chapters, starting with the very earliest manned machines used by the American Army, observation balloons.

The first suggestion of their use was in 1840 when a certain Colonel Sherburne suggested them as a way to spy on the Seminole Indians. This idea and a later one in the Mexican War was rejected and the first attempts were made in the Civil War.

Moving on to aeroplanes, on 2 August 1909 the Army had an aerial fleet of one Wright Type A 'Flyer', but no pilots! However things got better as we move to World War One and although much has been made of the Escadrille Americaine and the US Army Air Force at that time, most American pilots flew within British squadrons and eleven of the sixteen top aces obtained some, or all of their victories whilst flying with the RFC/RAF.

Further chapters cover subsequent periods, including 'Between the Wars', 'World War Two', 'From Berlin to Korea', 'Vietnam' and culminate with 'The Gulf War'.

The chapters are small but full of information. On nearly every page you will come across interesting facts. One such titbit was the story of the Women's Air Force Service. This started as the 'WAAC' and a certain Nancy Harkness who pressed the



by Chester G Hearn
Zenith Press
UK price £18.99
ISBN 978-0-7602-3308-2
260 x 260mm, Hardback 192 pp

Army for women to join the Air Force and qualify as pilots. Thus was born the Women's Auxiliary Ferrying Squadron 'WAF'. Later Jacqueline Cochran persuaded General Arnold to form the Women's Air Force Service Pilots. While the 'WAF' ferried aircraft the 'Wasps' piloted servicemen and supplies all over the United States and abroad.

My first impression was that this book would be an excellent starter to recommend to a youngster who shows an interest in aviation, but the more I read I found the less I knew about the US Air Force so even hardened enthusiasts could find this book useful...

Ernie Lee

Thanks to Zenith Press for the review copy.

Yakovlev Yak-23

The First Yakovlev Jet Fighters

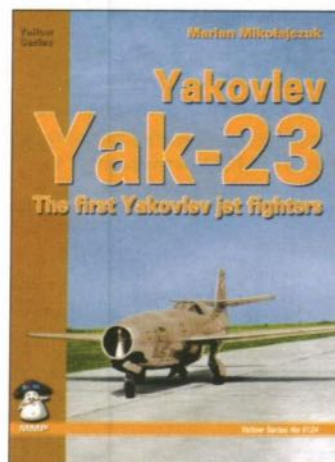
This is the latest in the 'yellow series' from Mushroom books and is packed with information, although the title is a bit misleading because it also covers the Yak-15 and Yak-17.

The book is divided into two parts, the first chronicling the development and the deployment of these aircraft and the second, easily distinguished by the use of different coloured pages, is the detail photographs and the colour profiles.

The book starts with the Yak-15 and follows the development of this aircraft. It is extremely well illustrated with both photographs and 1/72 scale drawings, including side views of the aircraft throughout its development. The Yak-17 and the Yak-17UTI are covered in similar vein and then we come to the Yak-23, also with a trainer version. The Yak-17 and Yak-23 were supplied to the Soviet satellite states and this again is well documented.

In the colour section are walk-around shots of all three aircraft, topped up with a number of 'manual' drawings. Lastly are the colour profiles – all fifty-four of them! All the Yak-15's are in Soviet markings and all are in dark green, apart, that is, from a machine of the aerobatic group which has red upper surfaces.

When it comes to the Yak-17, markings become a little more interesting. Most of the single-seat variants are again in Soviet markings, with the exception of one Czechoslovak and one Polish aircraft, but when



by Marian Mikotajczuk
ISBN 978-83-89450-54-8
Mushroom Model Publications
UK price £13.99
230 x 165mm, Softback 152pp

it comes to the UTI variant it is a different story. Other than Soviet machines there are examples of Chinese, Polish, Rumanian and even a Polish example in civilian livery.

Lastly the Yak-23. Again a good spread of nationalities and there is one that would cause a stir on the model meeting table – a machine in American markings!

This is yet another superb reference and one highly recommended for the student of Soviet designs.

Ernie Lee

Thanks to Mushroom Publications for the review copy.

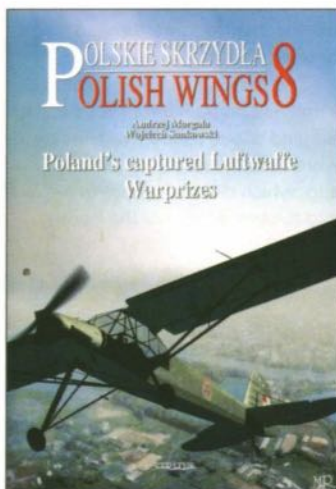
Polish Wings 8

Poland's captured Luftwaffe War Prizes

To be honest this book took me a little by surprise because the entry in the Midland Counties' (otherwise very comprehensive volume) on War Prizes gives not much more than a footnote on Polish War Prizes.

According to this book it is not surprising, as little was known about them. But these authors have put that right. When the Russians occupied Poland in 1945 they took back home everything that they thought would be of use to them, leaving wrecks and second line aircraft and it is these that were pressed into service.

The first type to be documented is the Fieseler Fi 156 Storch. The book lists twelve examples, nine of which are included, both photographically and in artwork. The schemes are varied. For instance 'SP-AGN' is shown circa 1949 and again in medical markings in 1951. Others saw service with the Interior Security Corps, the Independent Air Flight of



by Andrzej Morgala & Wojciech Sankowski
ISBN 978-83-89450-84-4
Mushroom Model Publications
UK price £9.99
296 x 207mm, Softback 56pp

the Polish Navy and with flying clubs. These machines are followed by

the Focke Wulf Fw 44 and Heinkel He 72, both types used by flying clubs, as was the Bücker Bu 181 Bestmann. The Messerschmitt Bf 108B had a more official use. The artwork illustrates an aircraft in three different schemes – first as an aircraft Independent Liaison Flight of the Interior



Security Corps and then in schemes of the Main Board of the Air League of Warsaw. And so we go on, with types such as the Klemm Ki 35D, Bücker Bu 131 Jungmann, Focke-Wulf Fw 58, Caudron C-445A1, and Moller 3V11.

The last chapter covers gliders, and here we have the SG-38, Grunau Baby, DFS Kranich, DFS Olympia, Goppingen and DFS Rhonbussard plus the LWD Osa and LWD Osa (powered gliders). All told there forty-eight colour profiles, some of which include multi-views, making this a superb reference and one that should be in the library of the discerning student of aviation

Ernie Lee

Thanks to Mushroom Model Publications for the review copy.

Ed Note: 'Techmod' have produced a decal sheet in 1/32, 1/48 and 1/72 for six of the Fieseler Fi 156C Storchs that are featured in this book.

Aviation History Colouring Book 65

RAAF Colour Schemes & Markings Pt 1

As the title suggests, this will be a mammoth task which I assume will take some time to produce. The author has chosen to start in 1921 because after the Great War there were a considerable number of surplus aircraft available, so the British government offered many of these aircraft free to the Dominions.

Australia received the following types:- Avro 504K, SE.5a, Sopwith Pup, DH.9 and DH.9A. These aircraft became the nucleus of the post-war Australian Air Force.

This particular volume describes eighteen types starting with the aforementioned. But first the author discusses the various colours employed at that time, the exact shades of which have always been contentious.

The first aircraft described is the Avro 504, some of which had been refurbished and the subtle differences in the paint schemes and markings are fully noted. This also applies to the drawings of the DH.9 and 9A, but with these aircraft we are beginning to see a little more colour, with the addition of silvery V-84 areas. This change of colour scheme becomes common with the other types that are included, and by the time we come to the DH Moth we get an overall V-84 finish.

To complete the package is a list of serials of all the types documented in the booklet.



by Ian K Baker
ISSN 1322-0217
Published by Ian K Baker
UK price £5.95 plus 50p post and packing from Mushroom Publications
300 x 227mm, Softback 24pp

This author has a knack of discovering previously unpublished information, so as the series progresses we could be in for some surprises.

Here we have yet another volume in the unique style of Ian K Baker with another segment of aviation history and a 'must' for any student of the period or indeed Australian aviation in general.

Ernie Lee

Thanks to Ian K Baker for the review copy.

Ilyushin Il-10 Colour and Markings

This is a completely new concept from this company. It is a landscape book in full colour with an accompanying decal sheet featuring no fewer than twelve schemes.

The schemes are: 'White 2', VVS KA, Germany late spring 1945; 'Red 34' 200th Attack Air Division, VVS KA, East Germany June 1956; 'White 57' VVS KA, Kuibyshev airfield, Soviet Union late 1940s; 'White NV-57' 3rd Sqn, Air Attack Regiment, Czechoslovak Air Force, Priestany Air Base 1953-1958; 'White UF-93, 4th Training Regiment, Military Training Establishment, Czechoslovak Air Force, Prostějov-Stichovice Air Base, September 1952; 'White 5256' 3rd Sqn, 45th Artillery Observation Air Regiment, Czechoslovak Air Force, Plzen-Line Air Base 1960-62; 'Blue 5', 5th Attack Air Regiment, Polish Air Force, early 1950s; 'Yellow 29', 23rd Attack Regiment, Hungarian Air Force, Topolca Air Base mid-1950s; 'White 49', 63rd Attack Air Group, Rumanian Air Force, late 1950s; 'White 103' 12th Attack Air



by Michal Ovcacik & Karel Susa
ISBN 978-80866370-6-8
Mark 1 Ltd
UK price £17.70 210 x 295mm
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Regiment, Plovdiv Air Base, Bulgarian Army Air Force, late 1950s; 'White 33', People's Liberation Army Air Force, mid-1950; and 'White 54', 57th Attack Air Regiment, Kimpo Air Base, Korean People's Army Air Force, summer 1950.

Each one is illustrated with a full page four-view with the rest of the pages taken up with mainly close-up shots of the aircraft, covering such things as undercarriage, interior and various opening panels and ordnance.

Please note that this book is produced for both 1/72 and 1/48 scale modellers, the only difference between the two being the decal sheet.

Ernie Lee

Thanks to Mark 1 for the review copy.



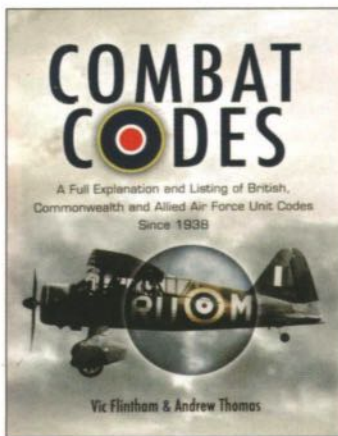
Combat Codes

One of the first recognition features to look for when trying to identify a photograph is to take note of the codes, and the next step is to look them up in whatever reference book you have – that's if you have one.

And here is the snag, the likes of Moyes and Rawlings published books on RAF Bombers and Fighters in 1976 describing Squadrons, but it was Halley who produced a book specifically dealing with codes and that was in 1980, nearly thirty years ago! That is before some of the readers of this magazine were born, thus making these books collector's items.

This book, which I believe is a reprint of the title originally published by Airfile in 2003, (and which cost £15.00 more incidentally), makes no attempt to discuss unit histories, but on the other side of the coin it is extremely comprehensive, covering far more than you would expect in one volume. The sub-title tells it all 'A Full Explanation and Listing of British, Commonwealth and Allied Air Force Unit Codes Since 1938'.

After a chapter instructing the reader how to use the book and an introduction to unit markings and



by Vic Flinham & Andrew Thomas
Pen & Sword Ltd
UK price £30.00
ISBN 978 1 84415 691 7
252 x 195mm, Hardback 272pp

codes, then comes the main index, followed by chapters covering different areas such as RAF pre-war, RAF wartime, RAAF, RCAF, Indian Air Force wartime, SAAF wartime and REAF wartime. The authors have left no stone unturned.

We have post-war British use of the wartime Code System, RAF Coastal Command, Flying Training, Fleet Air Arm, USAAF, US Army and many others, of which there

are two I must mention, 'Personal Codes' and 'Fictitious Codes used in films'.

Moving away from this mass of data we come the photographic content and there are hundreds of images to complement the text. Just looking at these will while away a few evenings in their own right.

It is very difficult to pick out individual aircraft of interest because we all have our personal choices, but just to give you an idea I have picked out some of mine. Top of the list must be the 35 Squadron SAAF Anson 'Float-plane'. This machine coded RB-Z was used to train new flying boat pilots in water skills and was not intended to fly. One other that I thought perfect for the modeller who likes to 'civilianise' military aircraft was a Sunderland Mk III. It was transferred to BAOC in 1944 as G-AGKX and wore the company 'Speedbird' motif, although in this shot it carried its Transport Command W/T call-sign 'OQZF'. But the most interesting thing about it is that many of the windows had been enlarged for passenger use as this machine was the prototype for the Sandringham.

If you didn't get the book the first time around, this is a 'must buy' for the aviation enthusiast – where else would you get photographs of a No 11 OTU SAAF Hurricane?



cane which carries a duplicate of a combat code and in the same book a C-45 Expeditor of the Station Flight RCAF North Bay?

This is a serious volume and is highly recommended.

Ernie Lee

Thanks to Pen & Sword Ltd for the review copy.

Osprey Aircraft of the Aces: 84

American Nightfighter Aces of World War 2

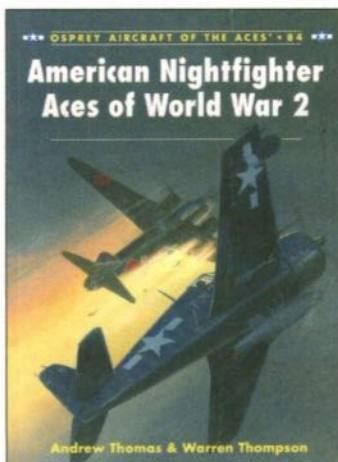
Two of Osprey's best known authors have combined their talents to produce this book on USAAF and US Navy/US Marines Aces of World War Two.

Starting with the development of night-fighting techniques in the UK and the USA, the book rapidly moves on to a large section covering American nationals flying with in the RAF and the British aircraft they flew in.

In fact it is well over half way through the book before the P-61 Black Widow enters the scene, but it is nonetheless well covered. The last quarter of the book features US Navy and Marines 'aces' and their aircraft.

There are eleven pages of profiles, superbly executed by Chris Davey, but annoyingly, printed vertically up the page, (which means you to have turn the book on its side to view them – one of my pet 'hates'), and five pages of wartime colour photos of USAAF and USN/USMC aircraft.

I would imagine most 'serious' aviation enthusiasts/aircraft modellers know of this series of 'Osprey Aces' books, and will buy them as a matter of course as



by Andrew Thomas & Warren Thompson
ISBN 978-1-84603-306-3
Gruppo Modellistico Trentino
UK price £13.95
250 x 185mm, Softback 96 pages plus card cover

each individual book is published, and this example maintains the standards we have come to know and expect of the series. Recommended.

Neil Robinson

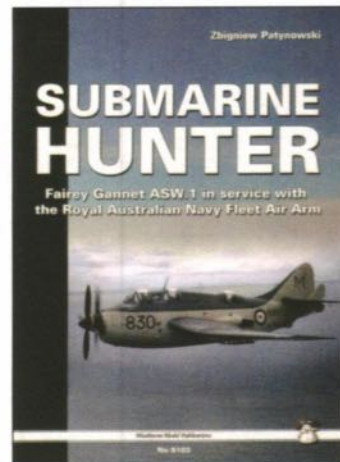
Thanks to Osprey Publishing for the review copy.

Fairey Gannet ASW.1 in service with the Royal Australian Navy Fleet Air Arm Submarine Hunter

As the title suggests this is not a comprehensive monograph on the Gannet but a very selective, albeit extensive, history of the aircraft in service with the RAAN. It is about the people that were involved with it and is full of anecdotes and mini biographies of not only the air and ground crew but the sailors of HMAS Melbourne.

But the story starts much earlier than this with the training of aircrews at Eglington in Northern Ireland. Then in 1955 the commissioning ceremony took place, at Culdrose, of Nos 816 and 817 Squadrons (Gannet) and 808 Squadron (Sea Venom), which is followed by the fortunes of the various air and ground crews.

The whole book is profusely illustrated with photographs of both aircraft and personnel, plus no fewer



by Ben Patynowski
ISBN 978-83-89450-57-9
UK price £25.99
295 x 210mm, Softback 248pp

than twenty-three colour profiles.

Apart from the obvious aircraft historian, this is a book that will appeal to a large number of ex-Australian servicemen, many of whom may even find they are mentioned in it!

Ernie Lee

Thanks to Mushroom Publications for the review copy.



US Experimental & Prototype Aircraft Projects: Fighters 1939-1945

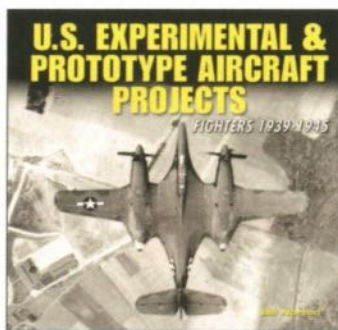
America's awesome World War Two production capacity, the 'Arsenal of Democracy', conjures images of massive manufacturing on matchless scales. But for aviation enthusiasts, it also suggests unparalleled development muscle, and that's the thrust of this book – a nifty compendium of American warplane evolution during the 20th century's crucial conflict.

Ever heard of Douglas' XP-48 light-weight, point-defense interceptor? Or its competitor, Tucker aviation's XP-57? They're there, and more. I spent many rewarding hours uncovering, and, in some cases recovering, proverbial pearls like the XF5F and XP-60 in Bill Norton's enjoyable volume. The author devotes over 400 colour and b&w photos, and dozens of drawings, to rare birds like these.

The text, logically, begins with factors and forces driving design development, what Norton calls the 'Background to Growth'. Early chapters detail the genesis of operational US types, both Army and Navy. Familiar names, Wildcat and Warhawk, Tigercat and Tomahawk, naturally dominate the coverage.

But the book also nestles nuggets therein. 'Misfits' like the Curtiss-Wright CW-21 Demon, Vultee P-66 Vanguard and, surprisingly to some, Supermarine Spitfire. After Britain, the book informs, "America remains the second largest user" of that distinguished design.

Subsequent chapters delightfully detail 'miscreants', 'aberrations' and 'experimentals'. That's where you'll find dead-end designs, both massive



by Bill Norton
ISBN 13: 9781580071093
Specialty Press
US\$44.95
255 x 255mm, Hardcover, 264 pages

and miniscule. Bill Norton's coverage of oddities like, for instance, Bell's lumbering FM Airacuda and light-weight XP-77, provides useful background for modelling Valom's and Czech Model's respective kits.

Don't let the title fool you, coverage includes attack aircraft, as well. From Brewster's ill-fated SB2A Buccaneer through Beech's sleek XA-38 Grizzly to Douglas' hefty XB2D-1 Dauntless II, (the legendary postwar AD/A-1 Skyraider), Norton seasons his treatment with dedicated bomb- and rocket-haulers.

Concluding chapters course through nightfighters and early jet designs, all fascinating stuff. I thoroughly enjoyed this book and eagerly await a companion volume on bomber designs. Highly recommended.

David L Veres

Thanks to Specialty Press for the review copy.

American Secret Pusher Fighters of WW II

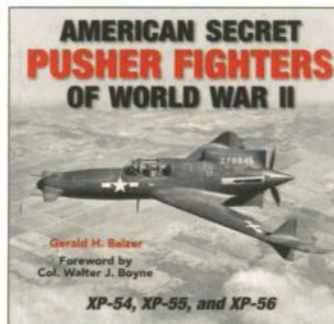
This dandy tome might have sprung straight from 1940's pulp fiction – if it weren't real! Gerald H Balzer's book details the spellbinding story of the Vultee XP-54, Curtiss XP-55 and Northrop XP-56 – arguably the most intriguing, visually stunning American warplane designs of World War Two. And what a ripping read it is.

The annotated, indexed volume describes these innovative endeavors in dazzling detail. Painstakingly researched, with 385 b&w and colour photos, dozens of drawings and charts, the book navigates the planning, development, testing and, ultimately, demise of these futuristic fighters.

The text falls into four chunky chapters, beginning with an absorbing background study of the original 1940 design competition. That's where you'll discover dynamics shaping the US Army's 'Request for Data R40-C', dozens of intriguing concept submissions, and ultimate contract awards. Just skimming the losers prompts plenty of counterfactual 'what-if' musings!

Three subsequent sections sequentially detail the book's principal protagonists, the winning XP-54, XP-55 and XP-56 designs. Tackling Czech Model's XP-56 'Black Bullet'? Considering MPM's XP-55 'Ascender'? Modellers will find Gerald Balzer's superb selection of illustrations a treasure trove of useful detail.

XP-55 images include, for instance, general arrangement schematics with precise dimensional data, close-up photos and detailed drawings – the last apparently from Curtiss archives. I considered the



by Gerald H. Balzer
ISBN: 9781580071253
Specialty Press
US\$39.95
255 x 255mm, Hardcover, 182 pages

XP-56 coverage even better. The 1/72 scale MPM example haunting my workbench will likely receive the intriguing Olive Drab and Medium Green finish apparent in the crystal clear factory shots. Now will someone offer an injection-molded XP-54?

Release of 'American Secret Pusher Fighters Of World War II' closely trails Specialty Press's equally interesting 'US Experimental & Prototype Aircraft Projects: Fighters 1939-1945' and perfectly expands and complements Bill Norton's corresponding coverage of the radical XP-54, XP-55 and XP-56.

Specialty Press is forging a deservedly brilliant reputation for unearthing aviation exotica with gems like these. Treat yourself to loads of fascinating, futuristic fun and buy this captivating book. Ravidly recommended.

David L Veres

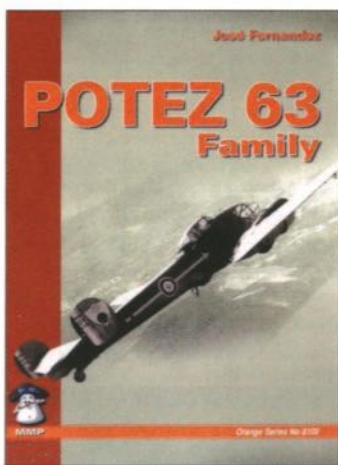
Thanks to Specialty Press for the review copy.

Potez 63 Family

This hefty softback in the Orange series is yet another bumper reference guide from this publisher. The first chapter guides us through the development of the series with informative text and good clear photographs and 1/72 scale drawings of the '630', '631', '633' and '637'.

This is followed by the operational service, first in the 'Phoney War' and then in the Battle of France Campaign – in all three roles, Fighter, Bomber and Reconnaissance. After that comes the description on the aircraft in combat and after, until the fall of France.

Also included in this section is its use by Greece and Romania and its participation on the Russian front. As with other books in this series we get a 'detail photos' chapter. It is divided into different parts of the aircraft,



by Jose Fernandez
ISBN 978-83-89450-65-4
Mushroom Model Publications
UK price £14.99
230 x 165mm, Softback 176pp

such as fuselage, cockpit, wings etc. There are many helpful photographs accompanied by a number of 'manual' drawings, just the thing for the modeller.

Moving on to the '63-11', again production and service with France and Romania, and also Hungary. There is a photographic record of this variant.

Lastly we have the massive colour profile drawings section – eighty examples in all! The schemes are certainly diverse. As you would expect, aircraft in French markings dominate this section, but also represented are examples of Polish, Yugoslav, Swiss, Greek, Rumanian, German, Italian, Spanish machines and even a number of Potez 63-11's in RAF service.

I must not forget one other inclusion. Because of the book's dimen-



sions it is not possible to show the type's plan views in 1/72 scale, but this is taken care of with a large sheet at the rear of the book with plan views of all the variants and, as a bonus. The reverse side had a very large cut-away drawing of the 63-11.

All in all this is a superb reference and one that should be in the library of any student of French or indeed World War Two aircraft.

Ernie Lee

Thanks to Mushroom Model Publications for the review copy.

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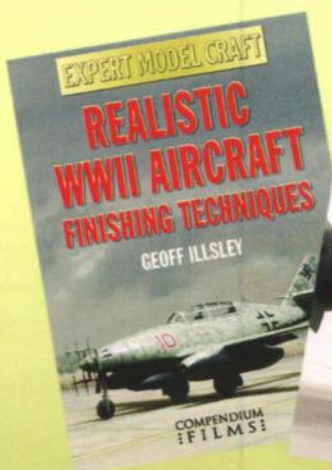
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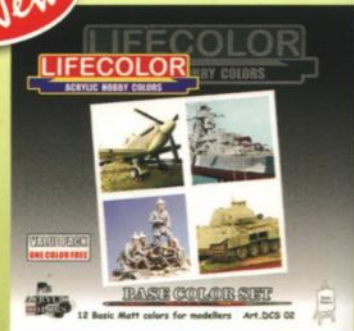
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